APPROPRIATE INSTITUTIONAL AND CONTRACTUAL ARRANGEMENTS FOR THE MARKETING OF ORGANIC CROPS PRODUCED BY MEMBERS OF THE EZEMVELO FARMERS' ORGANISATION IN KWAZULU- NATAL

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This study represents original work by the author and has not otherwise been submitted in any form for any degree or diploma to any University. Where use has been made of the work of others it is duly acknowledged in the text.

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ABSTRACT

The Ezemvelo Farmers' Organisation (EFO) is a certified organic smallholder group in KwaZulu-Natal province (South Africa) that exists as an institution to improve smallholder access to niche markets by reducing unit production and transaction costs. The study is motivated by the need to understand drivers of collective action, prevalence of internal group free-riding, and the impact of contract terms on contract performance. These three theoretical concepts are pertinent in understanding organisational and institutional issues affecting the performance of smallholder organic farming groups and in formulating policies to promote the performance of such groups. The study relies on the theoretical foundations of collective action, free-riding and contracts found within the realm of New Institutional Economics (NIE). These theories, though separate, are in fact related in certain respects. Collective action in smallholder groups, apart from being a function of a plethora of socio-economic factors, including transaction costs, could be constrained by free-riding within the group, which in turn could be influenced by flawed contractual arrangements.

This study of collective action focuses on 200 farmers drawn from a sample survey of 49 non-EFO members, and a census survey of 103 partially certified and 48 fully certified EFO members. A 'collective action' model investigates the impact of perceived benefits and savings on production and transaction costs attributed to collective action by drawing comparisons between EFO members and non-members using a multinomial logit model. The study of free-riding uses data from 151 members of the EFO to construct an index of free-riding within the group using principal components analysis (PCA). A 'contract model', which also focuses on EFO members only, attempts to measure the impact of verbal contract provisions on contract performance in addition to evaluating the

determinants of preferred contract terms using a combination of PCA, Ordinary Least Squares (OLS) regression, and logit models.

Results indicate that continued participation in EFO is not influenced by the age or gender of the farmer, but positively influenced by growth in the net benefits of participation, and negatively by an increase in the size of the household's cropland or non-farm earnings. With respect to production and transaction costs, the results suggest that EFO has reduced fully certified members' concerns that crops would be damaged by livestock or constrained by inadequate technical information. However, this is not the case for other problems such as price uncertainty in conventional markets, a lack of affordable operating inputs, a lack of affordable transport, and a lack of communications infrastructure.

The index of free-riding behaviour constructed using principal components analysis suggests that free-riding poses a serious threat to EFO's collective marketing efforts. Ordinary Least Squares regression analysis of the index scores shows that members who are male, poorly educated, partially certified, aware of loopholes in the grading system, and who do not trust the buyer are more likely to free-ride.

Benefits accruing to EFO members are limited and there is substantial confusion among members about the terms of EFO's verbal contract with the pack house that purchases their organic produce. Ordinary Least Squares regression analysis of the impact that perceived contractual terms have on quantities delivered to the pack house yielded interesting findings. Perceptions that delivery calls are made by the buyer, that grading procedures are flawed and that prices are not jointly established were found to reduce quantities delivered to the pack house, after controlling for differences in farm and farmer characteristics. Logit

models estimated to identify the determinants of preferred contract clauses indicate that farmers with higher levels of formal education and farm income, and lower levels of experience, favour a written contract over a verbal contract. Similarly, farmers with higher levels of formal education and lower levels of family farm labour favour a contract denominated by area rather than weight.

It is concluded that EFO should recruit households that rely on farming for income and which are land constrained. EFO is more likely to survive if it continues to secure fully subsidised information, transport, fencing, and certification services for its members, and if it improves the benefits of participating by synchronising harvest and delivery dates, negotiating price discounts for organic inputs, and by maintaining an office with telephone, fax and postal services. In the longer-term, EFO should address institutionalised free-riding by issuing tradable ownership rights. In the short-term, EFO must engage with the pack house (buyer) to remove flaws in the grading process that conceal the origin of low quality produce. Transparent and mediated negotiations leading to an incentive compliant contract with the buyer may also help to build trust and reduce free-riding within EFO.

It is also recommended that the terms of EFO's contract with the pack house should be revised so that; (a) delivery calls can be made by either the pack house or by EFO during specified periods and with reasonable notice, and (b) grading procedures are fully transparent and ensure traceability so that losses caused by poor quality can be internalised to members who deliver inferior produce. In addition, it is important that prices be negotiated at the beginning of each season and that the contractual parties have recourse to pre-agreed facilitators and an arbitrator to resolve disputes on price and quality. A written contract is recommended to support these more complex terms, with the proviso that the

contract is explained to current and prospective members, and that growers are fully informed of their rights and obligations.

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INTRODUCTION

1.1 Agricultural challenges facing developing countries

The world is facing a number of challenges: specifically the paradox that the world has sufficient food supplies, but millions of people go hungry; grain productivity has been declining in the last two decades despite increased use of chemical agricultural inputs; costs of agricultural inputs have been rising in the face of declining commodity prices in the last five decades; nutrition related diseases are on the increase in the face of abundant information and technologies; and industrialised food systems have environmental and social costs that threaten food security (Kalibwani, 2005).

Many sub-Saharan countries liberalised their markets in the mid 1980s and 1990s by embarking on market led poverty reduction initiatives to promote economic growth and counter these challenges. These initiatives produced mixed results (Kydd & Dorward, 2004) either due to partial implementation in some cases and/or complete policy reversal in others (Jayne *et al.,* 2002; Kherallah *et al.,* 2000). Despite these set backs, liberalisation presented new opportunities for smallholders by availing more market choice regarding produce markets and input suppliers.

South Africa's agricultural economy is made up of two sectors that are structurally disconnected. These are predominantly subsistence oriented rural sector and well developed commercial sector (Mbeki, 2004). The country's agricultural sector was liberalised and has been undergoing transformation since 1994. For example, marketing boards were abolished, subsidies eliminated, minimum farm wages introduced, and land reform programmes initiated. The question is whether horizontal coordination by

smallholders in alternative food production systems such as organic agriculture could provide the much needed impetus to develop the agricultural sector.

1.2 Emerging trends in the organic farming sector

About 120 countries worldwide are practising certified organic agriculture, with even a greater number of countries engaged in uncertified organic farming. Close to 51 million hectares of land worldwide are under organic certification. Africa has the least amount of organically managed land amounting to approximately 3 per cent of world's total organic holdings (Yussefi, 2006). At country level, South Africa has about 5 per cent of its total agricultural land under organic production and the number of organically certified farms increased from about 150 in 1999 to 240 in 2001 covering 45 000 hectares (Moffet, 2001; Yussefi, 2006). Globally, the major organic markets are North America and Europe, which both accounted for total organic sales of 27.8 billion United States dollars in 2004. The contribution of African markets to global organic sales is minute and a few African countries such as Egypt, Kenya and South Africa have small organic markets that are thinly traded.

1.3 Smallholder challenges in accessing high value organic markets

Numerous studies have identified a range of challenges prohibiting market access by smallholders. These include high transaction costs and problems of asymmetrical information, low local effective demand, and lack of competition among buyers leading to low prices (Kindness & Gordon, 2001; North, 2000; Kherellah & Kirsten, 2001). Low produce quality and quantity and high grading costs incurred by processors and traders and high assembly costs, market risk and cash flow problems experienced by intermediaries, all contribute towards dissipation of market incentives enjoyed by smallholders, thereby

hindering their ability to enter high value niche markets (Jones *et al.*, 2002). The market access problem is further compounded by spatial and scale factors, which in the absence of better coordination efforts, leaves smallholders unable to attain economies of scale and sufficient market power to negotiate better prices unlike large commercial farms (Johnson & Berdegue, 2004).

Temu and Temu (2005) attribute lack of smallholder access to high value markets to: changes in market chains in importing countries (where a few large retailers now prefer to deal directly with producers); the presence of oligopolistic buyers in domestic markets; and increasing demand for value added products – which demand substantial capital investments unaffordable to small producers. Hallam *et al.* (2004) argue that market access by smallholders is constrained by the need to comply with legal and commercial requirements (pesticide residues, phyto-sanitary requirements, hazard analysis, etc.), which impose additional costs on smallholders and renders their production system economically unviable.

1.4 Assessing effectiveness of institutional arrangements

To counter market access challenges, Stockbridge *et al.* (2003), suggest the use of new collective forms of organisation to assist with analysis, advocacy, marketing, bargaining and local development. Success stories like the Hortico Out-Grower Scheme in Zimbabwe, Fresh Produce Association in Kenya, Pool Marketing in Zimbabwe and the Capespan Group in South Africa all point to the need for collective marketing in accessing higher value markets (Temu & Temu, 2005). Organisations and institutional arrangements in developing countries are therefore important in creating incentives that reduce transaction

costs and promote efficient economic performance given the high occurrence of market failures and incomplete markets (Kherallah & Kirsten, 2001).

Horizontal coordination manifests in a number of ways ranging from informal agreements between producers to coordinate sales and purchases to much more organised groups that hire managers such as investor owned firms (Poulton & Lyne, forthcoming). Participation in such collection action is not without its own costs. Producers may have to contend with spending time at meetings, negotiating and complying with regulatory standards, and providing information to the organisation (Doner & Schneider, 2000). Such costs, and pervasive institutional problems manifesting themselves as free-riding, tend to discourage farmer participation and investment.

Different authors have defined collective action differently, but most definitions agree that it is action taken by a group directly or indirectly through an organisation in pursuit of members' shared interest (Sandler, 1992; Meinzen-Dick *et al.*, 2001). Much attention has been directed at explaining collective action and the factors that support or discourage it. Success of collective efforts depends on the nature of the collective action problem, group attributes, institutional arrangements, and external influences (Sandler, 1992). It is generally accepted that an individual's participation is greatly influenced by the costs and benefits associated with group participation (Matta & Alavalapati, 2006). One of the important benefits in organic farming groups is the expected reduction in unit transaction costs from economies of scale.

Transaction costs are the *ex-ante* and *ex-post* costs of carrying out economic exchange and are household specific (Key *et al.*, 2000; Goetz, 1992). *Ex-ante* transaction costs are predominantly fixed-exchange costs whereas *ex-post* costs are mainly variable costs associated with compliance and risk. Organic farmers are expected to encounter not only the usual transaction costs that prevail under conventional farming systems, but also costs associated with accessing and maintaining a presence in thinly traded organic markets. These costs, unless minimised, will discourage conversion to organic agriculture by new entrants and discourage those already farming organically. Transaction Cost Economics (TCE) theory has been applied generally to agricultural commodity and input markets in which transaction costs variables are treated as explanatory variables for different types of behaviour (Holloway *et al.*, 2000). In other instances, they have been taken as a response variable affected by other factors.

Closely connected to collective action is the prevalence of free-riding behaviour among group participants, which affects productivity of group members (Kidwell & Bennett, 1993). Free-riding is a form of opportunistic behaviour found in group institutions (Ostrom, 1992b) and is attributed mainly to ill-defined property rights (Sykuta & Cook, 2001). Internal free-riding occurs in circumstances where members access benefits without fully paying for the costs associated with their creation. Free-riding is relevant to organic farming groups as they produce intermediate goods such as storage and public goods like product inspection and market access, which are susceptible to free-riding due to limited excludability and high rivalry. Free-riding is expected to be influenced by trust, knowledge, household and context variables and groups size; growth in group size increases organisational costs and reduces per capita benefits (Ostrom, 1965; Alesina & La

Ferrara, 2000). Arrangements that ensure proportionality between costs and benefits could potentially curb free-riding in groups.

Existence of free-riding could be contextualised within prevailing contractual arrangements. Contracts motivate compliant behaviour and enhance contract performance by clearly stipulating the allocation of value, risk and decision rights associated with business transactions (Bogetoft & Olesen, 2002). Contracts can be analysed using either the Incomplete Contract Theory (ICT) or TCE frameworks. ICT is anchored on the hold-up problem emphasised by TCE, but discards the concept of bounded rationality. ICT is therefore useful in analysing contract structure that minimises *ex-ante* investment inefficiencies (Hart, 1995). The TCE assigns contract incompleteness to bounded rationality and views the contract as a tool for addressing *ex-ante* and *ex-post* investment inefficiencies (Saussier, 200b). In practice, a typical contract should cover the legal framework, the contract formula, format, and specifications (Eaton & Sheperd, 2001).

Smallholder farmers encounter varied contractual arrangements, often verbal and seasonal in nature, which influences contract performance (Eaton & Sheperd, 2001). Given that agricultural supply contracts are fraught with hold-up, adverse selection and moral hazard problems, there is need to protect smallholders entering into contractual relationships. Little is known about the effectiveness of collective action in reducing transaction costs and increasing market access due to limited knowledge about its emergence, sustainability, determinants, appropriate institutional arrangements and effective supporting policy options (Temu & Temu, 2005). Understanding of collective action is hampered by poor understanding of its determinants (Poteete & Ostrom, 2004). Lack of comparable data makes it difficult to evaluate the importance of many variables reported in literature as

influencing collective action. There has been very limited application of TCE to organic farming, let alone linking it with collective action to explain continued collective action efforts in smallholder organic farming systems.

While acknowledging the positive contribution of collective action towards addressing issues of market access by smallholders, there is need to understand sustainability issues because collective action problems differ in severity (Ostrom, 1990; 2000). In situations where exclusion is difficult, people free-ride on the efforts, undermining their collective efforts. Apart from studies investigating group size effects (Olson, 1965; Albanese & Van Fleet, 1985; Rokkan & Buvik, 2003), few attempts have been made to empirically measure levels of free-riding or to identify its determinants.

Application of contract theory has been largely theoretical, with some empirical studies regressing contract choice on observed farmer and farm characteristics (Ackerberg & Botticini, 2002). Analysis of contract provisions has dealt extensively with incentives, prices, and price adjustment methods. This could be because contract theory does not provide a unified structure for specifying and testing contract design hypotheses (Masten & Saussier, 2000).

1.5 An analytical framework for evaluating institutional arrangements in organic groups.

The subject of this study is to better understand and address the problems in collective action taken by smallholders who wish to exploit market opportunities. The study's main objective is to identify and analyse the following important issues; (1) factors underpinning the success of collective action in as far they influence a farmer's decision to continue

participating in the group effort, (2) measure and quantify the prevalence of internal free-riding and identify its determinants, (3) assess and investigate the impact of verbal contract clauses on contract performance, and identify the determinants of preferred contract clauses, and (4) to make policy recommendations that promote the functioning and sustainability of organic farming group institutions.

The study relies on the New Institutional Economics (NIE) analytical framework to address these issues. NIE, which draws on the strengths of Old Institutional Economics and Neoclassical Economics (Nabli & Nugent, 1989), is a deliberate attempt to provide a theory of institutions in economics by building on, modifying and extending the neoclassical theory. It capitalises on the strengths of neo-classical economics and the old institutional economics by providing a theory to explain the existence and operation of economic institutions. From a development perspective, NIE offers two useful theoretical approaches; (a) the theory of transaction and information costs (North, 2000; Stiglitz, 1985) and, (b) the theory of collective action (Olson, 1965; Sandler, 1992). Two major analytical approaches possible within the realm of NIE are that of transaction costs, information costs, and contractual choice on one hand, and collective action and elimination of free-rider problems on the other (Nable & Nugent, 1989). Despite these approaches having evolved separately they hinge on similar frameworks and axioms, and are affected by risk expectations and commodity prices and emphasise the role governments can play in an economic system.

The study uses EFO as an example to analyse institutional problems faced by smallholders who act collectively to market their produce. The use of EFO is important for a number of reasons: first, it is the first group of smallholders to be certified organic farmers in South

Africa; second, it provides a unique model of a development intervention that combines multiple dimensions of food security, ecological sustainability and market access; and third, it offers lessons relevant to EFO and to collective action taken by smallholders seeking access to preferred markets. Located in KwaZulu-Natal province, EFO was formed in 2001 and received organic certification in 2003. With 151 members, the group produces and markets organic produce such as *amadumbe (taro)*, baby potatoes, sweet potatoes, and green beans to Woolworths Stores through Assegai Organics, a pack house located in Durban.

The study is important because smallholders are often excluded from markets by a host of factors including high transaction costs and information asymmetries, and fixed marketing costs (like certification fees). Collective action enables smallholders to acquire group certification and so reduce their per unit transaction costs. However, such collective action to improve market access is fraught with free-riding and contractual problems that potentially threaten its sustainability. An informed understanding of how EFO developed, its institutional arrangements and how these arrangements affect its performance not only sheds light on ways to strengthen EFO, but also on theories about institutional arrangements purported to alleviate the free-rider and contractual problems that typically challenge smallholder marketing groups.

The specific research questions addressed by this study are as follows:

(1) Is EFO giving its members access to the organic market by reducing transaction and marketing costs?

(2) Is EFO's ability to give smallholders access to a preferred market for organic products constrained by internal free-riding?

(3) Is EFO's ability to give smallholders access to a preferred market for organic products constrained by a poorly designed contract with the buyer?

In answering the above research questions, the study uses quantitative data gathered in surveys of EFO members and neighbouring non-members' as well as qualitative information gathered in interviews with key informants on EFO's management committee.

1.6 Outline of the study

The rest of the thesis is structured as follows. Chapter 2 provides the context of organic agriculture in South Africa and looks at the agricultural policies changes implemented since 1994. An outline of developments around organic production and marketing and the organic trends in South Africa are presented followed by generally agreed definitions of a smallholders and smallholder farming group as per International Federation of Organic Agriculture Movement (IFOAM) guidelines. Issues around Internal Control Systems, their elements and importance to organic certification are then explored before presenting a case study on EFO.

Chapter 3 gives a broad overview of NIE and institutional arrangements, laying the foundation for in-depth analysis of theories relevant to the study. In particular, institutional economics themes are presented in the context of collective action and related institutional problems. Chapter 4 considers collective action theory, specifically the role of collective action in mitigating the impact of production constraints and transaction costs when

accessing organic markets. The conceptual and measurement issues around collective action are explained.

Chapter 5 considers free-riding behaviour in group institutions as one of the problems associated with collective efforts. The Chapter then explores free-riding theory in more detail including available empirical evidence. Chapter 6 provides the link between contract theory and free-riding in group institutions. Contract analytical frameworks availed by TCE and ICT are used to explain the role of contractual arrangements in supply chain relationships drawing lessons from existing body of empirical contract studies. Chapter 7 describes the study area, methods used to collect data, type of data gathered, and then postulates the empirical model of collective action followed by a discussion of the results. Chapter 8 presents the empirical model and associated results on free-riding at EFO, while Chapter 9 presents the empirical models and results of contractual arrangements at EFO. These empirical models and results are followed by conclusions and recommendations.

CHAPTER 2

ORGANIC AGRICULTURE: THE SOUTH AFRICAN CONTEXT

This Chapter gives an overview of the agricultural sector in South Africa and highlights the major agricultural policy changes since 1994. The emerging role of the organic sector is explained focusing on observable trends globally and in the South African context. The Chapter then presents generally acceptable definitions of 'smallholders' and 'smallholder farming group' as accepted by organic certifying bodies. The role of an Internal Control System is explained as it forms the basis for certification and ongoing monitoring of the group's compliance with organic standards. Lastly, the Chapter presents EFO as an example to illustrate different issues around smallholder group certifications.

2.1 Policy changes in South African agricultural sector

South Africa's agricultural economy comprises of a predominantly subsistence oriented smallholder sector- the second economy - and a well developed commercial sector- the first economy which are structurally disconnected (Department of Agriculture, 2001). Advances in first economy do not necessarily benefit the second economy (Mbeki, 2004). The agricultural sector has witnessed a series of policy changes since 1994 designed to reversing the impact of discriminatory legislation and liberalising the sector. Essentially, agricultural trade has been liberalised and marketing of agricultural products deregulated, Subsidies and certain tax concessions were removed, and minimum wages for farm workers were introduced (Mbeki, 2004).

2.2 The emerging role of the organic sector

Two distinct classes of organic agriculture are observable in Africa, namely certified organic production and non-certified or agro-ecological production (Parrott *et al.,* 2006). Certified production is earmarked mainly for export markets in Europe and North America, while agro-ecological farming is practiced to address challenges faced by smallholders. Organic farming is proposed to simultaneously address socio-economic, development and environmental objectives. Organic production applies innovative production methods anchored on indigenous knowledge systems developed over many generations. Organic agriculture attempts to manage complex ecosystems in a mutually beneficial way using local knowledge to meet household food production requirements, maintain the environment and build social reward (Twarog & Kapoor, 2004).

Organic agriculture production and demand has accelerated over the last few years. The share of agricultural land under organic farming continues to grow worldwide. About 120 countries practise certified agriculture, with even a greater number of farmers engaged in uncertified organic farming (Yussefi, 2006). Close to 51 million hectares of land worldwide was under organic certification in 2006, of which more than 31 million hectares (62% of 51 million hectares) consisted of 622 782 farms. The remaining 20 million hectares was under forests and wild harvested plants. The land use pattern of the 31 million hectares of certified organic farms includes permanent pastures (30%), arable land (13%), and permanent crops (5%), (Yussefi, 2006). While the amount of land under organic management differs by country, significant differences are evident at continental level. Australia/Oceania leads the pack with 39% of the world's organic land followed by Europe with 21% and then Latin America with 20%. Africa has the lowest proportion of organically managed land (about 3 per cent of world's total organic land), (Yussefi, 2006).

In 2004, global organic sales amounted to 27.8 Billion United States dollars mainly split between North America and Europe (Yussefi, 2006). Asia and Oceania have significantly smaller organic markets despite being the largest producers of organic products. Organic markets in African countries are largely thin or non existent with the notable exception of Egypt, Kenya, Uganda, Tanzania and South Africa (Parrott *et al.*, 2006). According to Auerbach, (2003 cited by Rundgren 2006), the value of organic sector sales in South Africa, both domestic and export, is estimated at between R200 million and R400 million per annum, driven by both the commercial and subsistence sectors.

By world standards, the South African organic sector is relatively small. The organic sector in South Africa is split between the smallholders and large commercial farmers (Rundgren, 2006). Certified organic production in South Africa started with exports in vegetables, rooibos tea, mangoes, avocados, herbs, spices, tea and subtropical fruit (ITC, 1999; Rundgren, 2006). It has since expanded to include a much wider range of products: organic wines, olive oil, speciality vegetables and berries, citrus and dairy products have become major export commodities (IFOAM, 2003). Different vegetables and culinary herbs form the core of the organic produce sold in South Africa itself (Export Promotion of Organic Products from Africa, 2006).

The South African organic sector has a long history dating back to the 1970s. The sector had about 50 small scale organic farmers in 1990 and the first group of farmers was certified by the United Kingdom Soil Association in 1993. Available statistics indicate that the number of farms in South Africa converting to organic farming has increased from 35 in 1999 to 150 farms by 2000 (Moffet, 2001). Grolink (2002) reported 240 certified farms

by 2002 covering 43 620 hectares, inclusive of pastures and in-conversion land. Auerbach (2001 as cited by Rundgren 2006), reported 291 farms in 2001 covering 200 000 hectares consisting of 25 000 hectares of arable certified land. As of 2005, Mead (2005 cited by Rundgren 2006), reported 200 farms in 2005 covering 515 000 hectares, of which 500 000 hectares is pasture and 10 000 hectares rooibos tea and the balance being planted to vegetables, wine and essential oils. The lack of consensus on the number of certified farms is rather puzzling, but does point to a lack of coordination in the sector. The statistics focus on large commercial farms and mask the extent of the communal and substance farmers' involvement in organic farming. South Africa has very few cases of documented smallholder organic growers and groups.

South Africa has begun to appreciate the role of organic agriculture in creating incomes and generating foreign exchange for the national economy, but like many other African states, the non-financial benefits of organic farming are rarely acknowledged and recognised. The potential for organic growth in South Africa is huge (Rundgren 2006), not only driven by exports, but by a growing substantial domestic organic market unlike in many other African states (Grolink, 2002). Many large retail chains are actively promoting organic products, particularly those supplied by smallholders who are given very little support, but are used extensively in the retailers' advertising campaigns.

The South African organic sector receives support from a number of organisations such as African Organic Farming Foundation (AOFF), Centre for the Promotion of Imports from Developing Countries (CBI), Food and Agriculture Organisation (FAO), IFOAM, and the International Trade Centre (ITC), (Rundgren, 2006). In South Africa, the promotion of organic agriculture has been handled by the Organic Agricultural Association of South

Africa (OAASA) and the Biodynamic Agricultural Association of South Africa (BDAASA) who together provide a network platform for all stakeholders. Other organic associations according to Rundgren (2006) are: the Cape Organic Producers' Association focusing on the Western Cape; the Network of Community Organic Farming Associations working with smallholders; and the Rainman Landcare Foundation (the only government accredited organisation offering training in organic agriculture). These organisations are mainly responsible for public relations, teaching and training, publishing, and other information dissemination activities (Rundgren, 2006; Parrot *et al.,* 2006) These organisations, though working at industry level, are geared towards rendering services to the large commercial sector at the expense of smallholders.

South Africa has two certification agencies namely Africa's Farms Certified Organic (AFRISCO) associated with Ecocert, and the Organic Agricultural Association of South Africa (OAASA), both of which certify exports to Europe, North America or Japan (Parrott *et al.,* 2006). Proposed regulations controlling the sale of organically produced food in the Republic of South Africa are being drafted in accordance with the international organic standards of IFOAM, European Union and the United States Department of Agriculture (Parrott *et al.,* 2006). A draft standard has been produced and is yet to be tabled before parliament even though for all practical purposes, it is being used to regulate the local organic industry (Rundgren, 2006).

2.3 Smallholder group certification guidelines

Participation of smallholder farmers in organic farming is only feasible under group certifications (IFOAM, 2003). IFOAM (2003) reported the existence of 350 grower groups in less developed countries with close to 150 000 membership mainly exporting their

products to the European and North American organic markets. However, it is important to clarify the definition of ‘smallholder’ and ‘smallholder group’ as they carry different meanings across different countries.

2.3.1 Definition of a smallholder farming group for organic certification purposes

The term ‘smallholder’ differs between countries and varies from one geographical location to another. The majority of sub-Saharan population living in rural areas can be considered as smallholders mainly because of their limited resource endowments relative to other farmers in the same sector (Dixon *et al.*, 2004). The size of land holdings also varies between countries and farming systems and is normally less than one hectare in areas with high population densities (FAO, 1997). Despite small farm sizes and poor resources endowments having often been regarded as the hallmarks of a smallholder, differences also exist with regard to household expenditure pattern, use of external labour, resource allocation, cash crop production, livestock ownership, off-farm activities and proportion of produce sold (Dixon *et al.*, 2004; FAO, 1997).

In the South African context, smallholders are commonly classified as subsistence, emerging, or commercial farmers (van Averbeke & Mohamed, 2006; Department of Agriculture, 2001). As a proportion of total farmers in South Africa, subsistence farmers are the majority and commercial farmers a minority with emerging farmers, those with a desire to produce on a commercial scale, sandwiched in between (Nieuwoudt, 2000). The vast majority of South African smallholders come from a historically disadvantaged background. Since farm land sizes varies from country to country, IFOAM (2003) precludes the use of farm size in defining a smallholder, relying instead on a matrix of eight criteria (Table 2.1) of which at least six criteria must be satisfied before a farmer can

be classified as a smallholder for organic certification purposes. Table 2.1 also presents the criteria used in qualifying a smallholder farming group for certification purposes. Only qualifying smallholders are permitted to form an organic smallholder farming group.

Table 2.1: Criteria used by IFOAM to define smallholders and smallholder farming groups

Smallholder criteria*	Smallholder farming group criteria
• Use of low-technology based production system • Farming system dependent on family labour • Farmer has limited capacity to market his or her own crop • Farmer has limited capacity for farm administration • Farmer has limited capacity to communicate in the language of the organic certifying agent • The farm has limited storage and or storage capacity • The farm's average annual income from the certified product is below approximately 5 000 United States dollars taken over a number of years (e.g. 5 years) • The farm would spend over 2 per cent of commodity export value on external inspection when not certified in a group (taken over a number of years e.g. 5 years).	• The cost of (individual) certification must be disproportionately high in relation to the sales value of the product sold. • The farm units are mainly managed by family labour. • There must be homogeneity of members in terms of geographical location, production system, size of the holdings, and marketing system. • No maximum amount of hectares per farmer is set. • Minimum size of the group is dependent on the situation, but must be large enough to sustain a viable Internal Control System. A practical guideline is a minimum of 30 to 50 smallholders per group. • Maximum size of the group is decided by the group and depends on the group's structure, capacity, and communication system. It is an element in the risk assessment process.

*The criteria can be adjusted by certification bodies to suit local conditions provided sufficient justification is provided for doing so.

According to IFOAM (2003), the smallholder farming group criteria shown in Table 2.1 must be supplemented with information about the general description of the operator, which must define the type of producer organisation (like co-operative, association, exporter with producers on contract). The smallholders' farming units must be clearly

identifiable under a clear administrative system and there must be a clear relationship between the group's central administration and the smallholders.

2.3.2 Internal Control Systems for certified organic smallholder groups

The development of systems worldwide by smallholder groups in association with certification bodies to ensure compliance with organic standards started long before government regulations were introduced. One of the cornerstones of group organic certification is the establishment of an Internal Control System. IFOAM (2003:11) gives the following definition of an Internal Control System:

"*An Internal Control System is a documented quality assurance system that allows the external certification body to delegate the annual inspection of individual group members to an identified body/unit within the certified operator. (As a consequence, the main task of the certification body is to evaluate the proper working of the Internal Control System.)*"

The Internal Control System must have an operator (legal form), a group production unit (for which the operator is responsible) when smallholders produce collectively and a farming unit or area, organic and or non-organic for which individual group members are responsible when production is done individually. The rationale for an Internal Control System is to reduce the cost of organic certification to smallholders by establishing a group that can do much of the monitoring itself. Then the certifier's job is to ensure that group processes and data collection are working well and to check regularly on a sample of the farms.

According to IFOAM (2003), the basic elements of an Internal Control System are a documented description of the Internal Control System, a documented management

structure, a responsible manager, internal regulations (production standards, and sanctions), conversion rules, a contract between the group and the certification body (e.g. AFRISCO at EFO), identified internal inspectors, and training of personnel including the manager, internal inspectors, producers and handlers. At household level, growers should have formal commitment, field records, and maps for each farm, annual inspection protocols, and a farm inspection report/form completed for each farm. An internal approval committee evaluates prospective members. The certified group should show a commitment to use internal sanctions, keep a regularly updated growers' list, assess risk, employ community surveillance, and document post-harvest procedures, including product flow and quantities (IFOAM, 2003). These measures suggest that smallholders will need external help in starting up and abiding by the IFOAM requirements.

Of the 5 per cent of agricultural land certified organic in South Africa, the proportion of land farmed by smallholders remains unknown (Rundgren, 2006). KwaZulu-Natal, apart from being one of the main agricultural provinces of South Africa, has also been home to the country's first organic groups known to be either fully certified or in the process of becoming certified. As of 2004, only a handful of grower organic groups existed such as EFO with 151 members, Vukuzakhe Organic Farmers Organisation (VOFO) with 40 members and Makhuluseni Organic Farmers Organisation (MOFO) with 41 members, all in KwaZulu-Natal. Northern Cape has Heiveld Co-operative with 42 members growing rooibos tea individually. EFO was established in 2001, while VOFO and MOFO were both established in 2003. EFO members produce independently, but market collectively, whereas VOFO and MOFO members produced and marketed vegetables collectively.

2.4 EFO case study

EFO remains central to the study of organic groups in South Africa as it marks the entry point of subsistence farmers into mainstream organic farming. The project has generated significant interest from government, academia, and business as a model for sustainable economic development. EFO is located in the province of KwaZulu-Natal. Communal areas account for 31% of the province's total land area and are characterised by smallholders practising low output subsistence agriculture (Matungul, 2001). Nevertheless, agriculture remains an important livelihood for many rural families, contributing a significant portion of their household income.

EFO is located in the Embo area of the former Umbumbulu magisterial district and consists of five traditional authorities: Embo, Embo-Kwakhabazela, Embo-NkishisiMahla, Embo-Timuni and Embo-Vumakwenza. Following recent changes in district municipal boundaries, Embo is now at the confluence of four magisterial districts; Ugu, eThekwini, Sisonke, and Umgungundlovu. The area has been described by the Centre for HIV and AIDS Networking (HIVAN) as rural with rugged topography and surrounded by commercial sugar-cane producers. Households are scattered over the deep hills and valleys (HIVAN, 2002).

The Embo area is governed by a traditional authority and traditional authority wards form part of municipality and magisterial districts. Embo has a population of 160 755 people (Municipal Demarcation Board, 2001). The major economic activities in order of decreasing importance are agriculture, manufacturing, social services and transportation (HIVAN, 2002). The community has limited access to communication, electricity and water infrastructure (HIVAN, 2002).

Prof Albert Modi of University of KwaZulu-Natal secured a R28 000 grant in year 2000 from the Department of Arts, Culture, Science and Technology to run workshops on 'Public Understanding of Science Engineering and Technology' at Umbumbulu, conscientising farmers on the value of indigenous and traditional crops, with a view to identifying research and rural development opportunities. This process culminated in the formation of EFO. EFO was formally founded in February 2001 by Prof Albert Modi and a group of 28 subsistence farmers from Ogagwini interested in growing traditional vegetables. The organisation, a loose association of smallholders driven by an ambition to succeed, was formed to address marketing problems experienced by farmers. Prof Albert Modi, a seed specialist from the then University of Natal worked closely with the farmers to improve their farming methods and product quality. The traditional vegetables, especially *amadumbe (taro)* were supplied to Pick 'n Pay for about two years before Woolworths came on board. Over the years, the organisation's membership has grown drawing its membership from seven locations including Ogagwini. Attempts to get EFO registered as a co-operative have been unsuccessful.

Prof Albert Modi and Dr James Hartzell of Assegai Organics assisted the farmers in initiating the certification process by preparing required documentation for organic group certification and developing market for the organic produce. Due to the group's successes, other stakeholders came on board. The KwaZulu-Natal Department of Economic Development and Tourism provided farmers with fencing material and AFRISCO conducted EFO's first year certification in 2003 on a pro-bono basis making EFO the first group of subsistence farmers in South Africa to attain group certification status.

In 2004, the group's membership stood at 151 consisting of 48 fully certified and 103 partially certified farmers. Fully certified farmers were those who had met all the certification requirements and consisted mainly of founding members. Partially certified farmers were those in the conversion stage. These are farmers who applied to join the group later, had fulfilled all the certification requirements for group certification, but were waiting for a certification decision by the certifying body, AFRISCO.

The promoters of EFO were inspired by the members' determination to succeed and to use their lack of access to mechanisation, fertilisers, hybrid seeds, pesticides and herbicides as a case for group certification. A new model for rural development was being pioneered. While the original focus was on producing traditional vegetables (old varieties passed from generation to generation), EFO now produces *amadumbe (taro)*, sweet potatoes, baby potatoes and green beans. These crops are retailed in Woolworths stores around the country.

EFO has open membership and egalitarian voting rights. In essence, any new member interested in joining the organisation is free to do so provided all the qualifying requirements as stipulated in the groups' constitution are met. The organisation has no share ownership scheme for its members. The organisation is managed by a management committee made up of the chairman and vice chairman, secretary and deputy secretary, treasurer, and three committee members elected from the floor. The management committee also acts as a board of directors providing overall strategic guidance and exercising control over the organisation assets and resources. EFO holds mandatory monthly member meetings usually at the beginning of each month to share information and update members. *Ad hoc* committee meetings are held under special circumstances only.

There is one independent committee that reports to the management committee known as the certification committee. The certification committee is made up of elected members from the general membership. Its function is to process applications from potential new members, deal with compliance issues of existing members and make recommendations to the management committee in cases of non-compliance with organic rules. It also provides an oversight role over the internal inspectors.

The group has an established Internal Control System. An Internal Control System is originally developed to assist smallholders in marketing, record keeping and communicating with the certifier and competent authorities. EFO has eight internal inspectors whose role is to monitor member's compliance with organic standards and to report any transgressions to the certification committee for disciplinary hearing and sanctioning. Violation of organic standards by a single member may result in the revoking of the group's organic certificate. Inspectors, paid for by the organisation, help to reduce the annual inspection bill from certification agencies as the group does most of the monitoring itself.

EFO farmers own individual plots under a communal land tenure system. Each member carries out crop production individually and is responsible for all farming operations on his or her plot. These include land preparation, procuring inputs, planting, crop maintenance, harvesting and grading. During this production phase, internal inspectors monitor the members to ensure compliance with organic production principles. When it comes to marketing, following a call from the buyer for deliveries to begin, farmers bring marketable produce to designated delivery points throughout the villages, where it is weighed by designated EFO members, tagged with farmer's name and shipped to the pack

house. The pack house records the weights again against each supplying member's name but pools the produce before grading in order reduce grading costs. Farmers, in essence, are paid for the weight of their produce regardless of the amount that is rejected.

The marketing contract is essentially a gentlemen's agreement between the pack house and EFO. At the beginning of each marketing season negotiations are held between the pack house and EFO to set produce prices. These effectively become the ruling prices throughout the marketing season. The pack house makes calls to farmers for deliveries to begin, and stipulates the amount and type of product to be supplied. Payments for produce delivered are made twice every month. The buyer commits to buy produce quantities of acceptable quality as indicated in his call for deliveries. Each EFO member is given an equal quota to supply the pack house, but this is adjusted upwards if some members are unable to fulfill their quotas.

The members still face a number of challenges as organic farmers. Access to clean and disease free seed is a problem. The increasing number of farmers going organic has increased the demand for kraal and compost manure and sometimes for fertilizers and other inputs, which are expensive. Not all of the farmers have knowledge about organic farming and access to such information is limited. Information about prices in the organic sector is proprietary which constrain smallholders' ability to identify profitable marketing options. Damage to crops by livestock is still a major concern for members with unfenced fields.

2.4.1 Relevance of EFO example

EFO members have reported increased crop yields and revenues from organic sales, which could potentially attract new members. It remains to be seen whether or not the group will withstand the pressure associated with an expanding group size in the medium to long term. As the first successful case of organic group certification, EFO is used as an example to understand the constraints facing similar collective action groups and to draw lessons needed to inform EFO, stakeholders in the local organics industry and policies and strategies to integrate smallholders in to niche markets.

2.5 Chapter summary

South Africa has dual agricultural economy made up of a commercially oriented large scale farming sector and a predominantly rural smallholder sector. The agricultural sector has undergone transformation that resulted in the liberalisation of agricultural trade, removal of control boards, subsidies and tax concession, introduction of land reform programmes and minimum farm wages. This is similar to developments that have taken place earlier in the sub region.

Organic agriculture worldwide is experiencing rapid growth in terms of the amount of certified land and global organics sales. Organic sales are largely driven by increased consumer demand for organic foods by North American and European consumers. Africa's contribution, both in terms of certified land and organic sales, is still relatively small compared to other continents. South Africa has a small proportion of its total agriculture land under organic agriculture, but figures point to an encouraging upward trend in terms of numbers of certified farms and certified land over the last decade driven by large commercial farmers. Interestingly, the contribution of South African smallholders to the

country's total organically certified land and organic sales is still not clear. The country's major organic export crops are rooibos tea, tropical and sub-tropical fruit, wines, herbs, spices and vegetables. The South African organic sector has received support from many organisations and currently the country has two certification agencies responsible for certifying local and export organic produce, despite the lack of national organic standards and regulations that are awaiting approval by the South African parliament.

Smallholders can only play a meaningful role in organic farming and marketing if they meet the definition and six of the criteria stipulated by IFOAM as minimum requirements for group certification. Land size is not an acceptable criterion for defining a smallholder farmer and is excluded from the IFOAM criteria. In order to get organic certification, smallholders must establish a viable Internal Control System that assists in monitoring group members' compliance with organic standards. South Africa has a few cases of documented organic groups of which EFO is one. EFO, established in 2001 and certified in 2003, is used as an example to understand institutional problems and sustainability issues around collective action taken by smallholders in an attempt to access higher value niche markets. It is the first group of subsistence farmers to be certified in South Africa and supplies the local organic market through Woolworths. It is therefore an important example of collective action from which lessons can be extracted to inform theories about institutional arrangements designed to mitigate free-rider and contractual problems facing smallholder marketing groups.

CHAPTER 3

NEW INSTITUTIONAL ECONOMICS AND ORGANIC FARMING GROUPS

This Chapter provides a broad overview of the NIE framework generally used in conceptualising institutional problems and lays the foundation for the analysis of major themes relevant to the study of farmer organisations such as collective action, free-riding, and contractual arrangements. Since these three themes invariably revolve around institutions, a working definition of the term 'institution' is explored together with the study's conceptualisation of institutional arrangements in smallholder groups. The last section of the chapter describes common institutional problems encountered in farmer organisations with ill-defined property rights structures and highlights those that are relevant to the study of organic groups.

3.1 An overview of the New Institutional Economics

The purpose of NIE is to explain the operations of institutions, their development over time and how they impact on economic development (Nabli & Nugent, 1989). Williamson (1979; 1985; 2000) refined the Coasian arguments about property rights and transaction costs and coined the phrase 'New Institutional Economics'. NIE is distinct from old institutional economics developed by Commons and Veblen (Paarlberg, 1993) in that old institutional economics operated outside neoclassical economics and had no theory apart from postulating that institutions were a key factor in explaining and influencing economic behaviour. Neoclassical economics, which presumes perfect information, zero transaction costs, and full rationality, as some of its underlying assumptions ignored the role of institutions and failed to explain why markets fail. NIE combines the core competencies of both the old institutional economics and neoclassical economics theory providing an

analytical framework with theory and institutions in which institutions are included as additional constraint. It is important to note that most of the key assumptions of neoclassical economics are relaxed except the assumption of atomistic, self-profit maximising individuals (Mathews, 1986).

According to Williamson, (2000), NIE operates at both macro and micro levels of society. The macro level deals with higher levels of analysis such as the policy environment that affects the behaviour and performance of economic actors and in which organisational forms and transactions are rooted. The micro level analysis deals with arrangements that govern transactions and includes market, quasi-market and hierarchical modes of contracting. Micro level analysis focuses on individual transactions and organisational forms. At this level, institutions are arrangements between economic agents that govern the ways in which they can cooperate and/or compete (Sauvee, 1998; Kherallah & Kirsten, 2001). It is at the micro level that NIE is relevant to the study of organic farming groups.

3.2 Themes in New Institutional Economics

NIE is by definition a multidisciplinary field of study made up of several branches. Broadly it comprises of new economic history (North, 1990), public choice and political economy (Buchanan & Tullock, 1962; Olson, 1965; 1982), new social economics (Putman, 1993), transaction cost economics (Coase, 1937; 1960; North, 1990; 2000; Williamson, 1985; 2000), theory of collective action (Olson, 1965; Hardin, 1982; Sandler, 1992: 19), and law and economics (Posner, 1984). The transaction cost economics branch spans three sub-branches of economics of information (Akerlof, 1970; Stiglitz, 1985), property rights (Hart & Moore, 1990), and social capital (Putman, 1993). The social capital sub-branch is shared by new social economics. The analytical framework availed by transaction costs,

collective action, free-riding, and contract theories can be used to analyse organic farming institutions and is explored further in subsequent chapters.

3.3 Institutions and institutional arrangements defined

The term ‘institution’ has been the most controversial in the realm of NIE. Different definitions have emerged overtime, each emphasising quite different aspects of a more general phenomenon. The characteristics of institutions that vary are the degree to which they are (a) organisational, (b) formal, (c) created at a specific time and place for a specific purpose, (d) embedded in other institutions, (e) universal in the interests they serve, (f) creating a public good and (g) technology linked (Nabli & Nugent, 1989). Schotter, (1981) views institutions as regularity in social behaviour that is agreed to by all members of society, specifies behaviour in specific recurrent situations, and is either self-policed or policed by some external authority.

Heiner (1983) adopts a similar ‘social’ definition, as does Uphoff (1986) who sees institutions as complexes of norms of behaviour that persist over time by serving collectively valued purposes. However, there are other definitions, which emphasise the rules aspect of institutions. These include the view that institutions are rules that structure repeated human interaction (North, 1997). The commonly agreed ‘economic’ definition of institutions is that which defines them as a set of formal rules (laws, contracts, political systems, organisations, markets, and informal rules of conduct (norms, traditions, customs, value systems, religions, sociological trends) that facilitate coordination or govern relationships between individuals or groups (Kherallah & Kirsten, 2001). This is consistent with Ruttan and Hayami’s (1994) earlier definition that institutions are rules of a society or

of organisations that facilitate coordination among people by helping them form expectations that each person can reasonably hold in dealing with others.

Despite these differences, most definitions appear to have three basic characteristics. The first characteristic is the 'rules and constraints' nature of institutions, which Ostrom (1986) defined as prescriptions commonly known and used by a set of participants to order repetitive, interdependent relationships. The second characteristic of institutions is the ability of their 'rules and constraints' to govern relations between individuals and groups. The third characteristic of institutions is their predictability (applicable in repeated and future situations). This study treats formal organisations, markets, contracts, cultural rules and codes of conduct as institutions in the framework of NIE.

NIE provides two general approaches for analyzing institutions. These are transaction costs, information costs and contractual choice on one hand, and collective action and elimination of free-rider problems on the other (Nabli & Nugent, 1989). The transaction costs and information costs approach has three sub-themes. The first sub-theme examines the role of transaction costs in influencing transaction decisions. The second sub-theme uses a property rights approach (Coase, 1960) to explain how technological and other conditions (including externalities) relate to property rights, and the evolution of institutional mechanisms for internalising benefits and costs (Nabli & Nugent, 1989). Property rights are linked to transaction costs because secure property rights reduce transaction costs and therefore improve market efficiency. The third sub-theme is that of incomplete information, and asymmetries in information in particular. The three sub-themes evolved separately but are related as information problems are a source of transaction costs (Stiglitz, 1985).

For example, the problems of moral hazard and adverse selection arise in contracts where asymmetries of information are present. Nabli and Nugent (1998) argue that information asymmetry is closely related to opportunistic behavior and transaction costs. Information asymmetry and information systems impact on the structure and productivity of principal-agent relationships. When a principal has information to verify agent behavior, the agent is more likely to behave in the best interests of the principal. The principal can curb free-riding by investing in information systems to verify behavior. The economics of transaction costs and costly information have acknowledged the existence of the agency problem in contractual arrangements (Williamson, 1985).

The other general approach of NIE concerns collective action and the elimination of free-rider problems in the provision of collective goods. Collective action may take varied forms, but its drivers seemingly encounter more or less similar problems that may lead to dissipation of momentum and eventually its demise. For example, most communal projects are organised around conventional cooperatives, as opposed to new generation cooperatives, and are fraught with free-riding problems, horizon, portfolio, and control and influence problems. Even though these approaches of NIE (transaction costs, information costs, and contractual choice, on one hand, and collective action and elimination of free-rider problems on the other) have developed separately, they are in fact related. Firstly, they are based on similar frameworks and axioms. Secondly both are affected by factors such as risk expectations and commodity prices. Thirdly, they emphasise the role of government (Nabli & Nugent, 1989). The following sections discuss institutional nature of organic farming groups in South Africa.

3.4 Institutional problems confronting organic farming groups

Cooperation between small farmers and the governance of supply chains present important opportunities for contract farming to link smallholders and agribusiness firms in the high value organic market chain (Kirsten & Sartorius, 2002). There are many reasons why farmers resort to collective action. Among them are the need to reduce risks, increase market share, increase marketing margins and profitability, create jobs, resist opportunism and hold up situations, reduce transaction costs and substitute for missing or imperfect markets (Cook & Iliopoulos, 1999).

It is feasible that some of these problems prompted the formation of organic farming groups in KwaZulu-Natal such as the EFO, in accordance with guidelines set by the IFOAM. The formation of organic producer groups would greatly reduce the buyer's transaction costs who would otherwise have to administer small contracts to a large group of farmers. Consequently, collective action (e.g., through traditional farmer cooperatives) does not have a good record of success owing to inadequate property rights that entrench free-rider problems (Knight *et al.*, 2003). A traditional cooperative is one characterised by the Rochdale principles; for example, net margins distributed according to patronage, democratic control (one member one vote), limited return on stock, restrictions on the number of shares owned, open membership, and shares traded at par-value so members cannot internalise capital gains (Roy, 1964).

Local organic farming groups have constitutions, which outline the organisation's objectives, general membership rules and the composition and roles of the executive committee and internal approval committee. The structure and content of the constitution depends to a large extent on the organisational form that the group adopts. Taking EFO as

an example, its original constitution makes it a loose marketing association of its members organised along the lines of a conventional marketing cooperative.

In general, the constitutions of organic farming groups do not guard against the problems common to conventional cooperatives. EFO's constitution does not explain adequately the articles of its business, membership application procedures, responsibilities of its members, grounds and procedures for a member's expulsion, conduct of meetings and auditing requirements. Nor does it adequately define members' voting and benefit rights. Given such ill-defined property rights, it is impossible for members to fully internalise the benefits of their investments of time and money in negotiating and complying with contracts, or in improving services and facilities. A number of cooperative theory scholars have conceded that traditional cooperatives are plagued by institutional problems in the form of free-rider problems, portfolio problems, horizon problems, control problems and influence problems. These problems emanate from ill-defined property rights when designing organisations (Cook & Iliopoulos, 1999).

A free-rider problem exists when the gains from cooperative action can be accessed by individuals who did not fully invest in developing the gains, for example, new members who acquire the same rights as initial investors without paying the appreciated price for their shares (Cook & Iliopoulos, 1999; Sykuta & Cook, 2001). This happens because shares must be traded at par value, and not market value. As a result, new members obtain the same patronage and residual rights as existing members and are entitled to the same payment per unit of patronage without paying fully for these benefits (Knight *et al.*, 2003).

The horizon problem occurs when residual claims on the net income generated by an asset are shorter than the economic life of the underlying asset and are not transferable (Porter & Scully, 1987). This creates a disincentive to invest in opportunities that create growth, such as research and development. Instead, board members are under pressure to increase cash flow devoted to current payments and equity redemption at the expense of retained earnings (Cook & Iliopoulos, 1999). In the case of local organic farming groups, membership rights are not tradable, and so discourage members from investing in long-term and intangible assets (like a brand name) needed for the organisation to grow. New members become free-riders as they benefit from investments made by founding members without paying for them.

The portfolio problem can be viewed as another equity acquisition problem (Jensen & Meckling, 1976). Without transferability mechanisms, residual claims cannot be exchanged to reflect the risk attitudes of any given member, i.e., members cannot restructure their investment portfolios to reflect their own risk preferences i.e. they become forced-riders (Knight *et al.*, 2003). The control problem relates to the cost that members incur in monitoring managers to ensure that they act in the best interest of members (Staatz, 1987). The control problem also arises because share prices are fixed at par-value and therefore do not provide members with information about managerial performance. This is compounded by the fact that organic farming groups lack management information systems within their organisation's management structure.

Influence problems are common when decisions affect the distribution of wealth among members and members have equal voting rights (Sykuta & Cook, 2001). Egalitarian voting rights prevent concentration of managerial control in the hands of those who contribute the

bulk of the capital. The diffusion of voting power may result in exploitation of large lenders and investors by a majority of risk-averse members who contribute relatively little capital. An attempt in the United of States America to address these problems has led to the rise of New Generation Cooperatives similar to investor-owned firms (Sykuta & Cook, 2001) with well-defined property rights proportional to individual investment. In South Africa and Western European countries, where subsidies have been withdrawn from cooperatives, there has been outright conversion of cooperatives to company status (Knight *et al.*, 2003). All these problems have relevance to EFO. This study focuses on those that lead to free-riding.

3.5 Chapter summary

NIE draws on the strengths of the old institutional and neo-classical economics in its attempt to explain the functioning and impact of institutions. It relaxes most of the neoclassical economics assumptions except that of atomistic self-maximising individuals. NIE operates at both the macro and micro levels. The macro-level analysis deals with policy issues and their impact on economic actors, whereas micro-level analysis deals with arrangements that govern transactions between economic actors such as contracts. NIE has many themes including transaction costs economics and collective action and their sub-branches, which revolve around institutions. NIE provides two general approaches for analysing institutions of transaction costs, information costs, and contractual choice on one hand, and collective action and elimination of free-rider problems on the other. Despite differences over the meaning of institutions, there is agreement that institutions are rules and constraints that govern relations between individuals and groups in a predictable manner. It therefore follows that the NIE conceptual framework is useful for analysing

organic groups, which are themselves institutions susceptible to institutional challenges such as free-riding, horizon, portfolio and influence problems.

CHAPTER 4

COLLECTIVE ACTION THEORY

The adoption of sustainable environmentally friendly production methods would help smallholders to access higher value markets. However, small producers must first group themselves into identifiable structures and apply for group certification. This Chapter considers the theoretical foundations for collective action by smallholder farmers growing organic crops in an attempt to counter production, marketing and transaction costs constraints prevalent in the organic sector. Lessons are extracted from the general field of natural resources management that are relevant to the study of collective action in organic groups. To give context to the role of collective action in reducing transaction costs and information asymmetry problems in the organic sector, theoretical and empirical TCE is presented and its link with the organic sector explained. The Chapter then concludes by comparing benefits and costs experienced by organic and non-organic farmers. In short, this Chapter provides a platform for evaluating the sustainability of EFO's collective marketing efforts in the presence of production, marketing and transaction costs constraints.

4.1 Improving smallholder access to organic markets

There is a growing interest in developing and developed countries to improve the livelihoods of poor smallholders facing production and marketing constraints in fresh produce supply chains (Acquah & Masanzu, 1997). Technological advances have long been mooted as a panacea for problems affecting smallholders. Numerous studies have investigated factors affecting adoption of new and improved technologies, institutions, and farming systems, including organic agriculture (Duram, 1999; Freyer *et al.,* 1994).

Organic agriculture requires a management system that enhances biodiversity, biological cycles and soil biological activity with minimal use of off-farm inputs, and which promotes practices that restore, maintain and improve ecological harmony (NOSB, 1995). Organic agriculture represents the most regulated form of agriculture as it adheres to legally defined standards and norms of production, processing, and labeling. A shift to organic agriculture by farmers therefore encompasses ecological, agronomic, economic (farm income, markets and food security), social, and institutional dimensions (Scialabba, 1999) and requires that individual farmers participate in collective production and marketing activities in one form or another.

4.2 Collective action theory

Numerous definitions of collective action have emerged over time. Marshall (1988) defines collective action as action taken by a group, either directly or on its behalf, through an organisation in pursuit of members' shared interests. In some studies, collective action is defined in terms of the effort that must be made by two or more individuals to accomplish an outcome (Sandler, 1992:19). Most definitions agree that collective action requires involvement of a group of people with shared interest in some common action directed towards achieving the shared interest (Meinzen-Dick *et al.,* 2001). Additionally, these definitions implicitly assume that there is some degree of collective decision-making in the pursuit of members' shared interests.

However, many studies on collective action have focused on Community-Based Natural Resource Management, analysing the performance of group management institutions (Lele, 2000). Successful collective action has been viewed as largely dependent on the perceived success of the collective action itself (Anderson, 1995; Lubell, 2002).

Smallholders in South Africa are not new to collective action, but collective action in certified organic groups is a relatively new development, dealing with a different set of rules and niche products in highly specific markets and supply chains.

Recognised as an important component of rural development and local natural resource management, collective action, remains a difficult issue to measure and analyse empirically (Meinzen-Dick *et al.,* 2004). Differences exist over appropriate measures of collective action and underlying success factors (Dasgupta & Serageldin, 2000). Place *et al.* (2002) alludes to the lack of standardised measures or indicators for measuring the existence, viability and effectiveness of collective action.

In natural resource management, the major thrust has been to understand and solve problems created by the so called 'tragedy of the commons'. For example, uncontrolled communal grazing has caused degradation of grazing lands in many developing countries (Grebremedhin *et al.,* 2004). Privatisation, state ownership, and imposition of use rules by external forces as alternative governance mechanism have limited appeal as enforcement costs could be prohibitively high and users have incentives to shirk (Wade, 1988). Collective action supported by relevant institutions has a far greater chance of succeeding in improving natural resource management (Pender, 1999; Rasmusen & Meinzen-Dick, 1995).

Not withstanding measurement problems and differences over what constitute collective action success factors, valuable lessons can be extracted from these natural resources management studies that have wider application to other fields of study such as collective action. For example, successful community resource management has been realised where

the necessary condition of transferring user and decision rights to local communities through establishment of rules and regulations and enforcing them was satisfied, and where rules and regulations were effectively observed (Turner *et al.,* 1994). In organic agriculture, IFOAM has established rules and regulations governing certification of smallholder organic groups and has devolved their implementation to individual groups through the establishment of an Internal Control System. The Internal Control System is established, managed, and observed by the group members themselves.

4.3 Collective action in organic groups

When markets fail due to imperfect information and high transaction costs, horizontal coordination can promote participation in local markets and competition in wider markets. One approach taken to improve smallholder access to organic markets has been the formation of certified organic groups using IFOAM guidelines and enforced by certification agencies such as AFRISCO in the case of South Africa. Under the group certification system, organic farmers can either grow and market their produce collectively or produce individually but market collectively. In either case, group certification requires that farmers engage in collective action.

It is estimated that in 2001 there were 350 different organic groups found in less developed countries with an estimated 150 000 membership and exporting about 70% of the volume of products imported into Europe (IFOAM, 2003). The number of organic groups and smallholders participating in certified organic farming in South Africa is unclear, but only a few organic groups are known. These export markets (including local South African organic market) pay premium prices, which impact positively on the livelihoods of the farmers concerned. In order to access these markets and reduce organic certification costs,

farmers are ordinarily grouped or group themselves into an association or co-operative that has legal status and apply for a group certification. The certification of organic groups has come a long way. According to IFOAM (2003), in the mid-eighties, certification was granted on the basis that a group was organised, an internal support structure was present, and a *de facto* inspection was in place.

IFOAM began to regulate this certification process in 1996. Given the confusion around certification criteria, differences of what constitute an Internal Control System and around the definition of a smallholders and smallholder farming group, IFOAM commissioned workshops in 2001, 2002, and 2003 to reach consensus on these contentious issues. While the IFOAM guidelines provide common understanding of the issues at stake, it is clear that farmers must organise themselves and be able to maintain a robust Internal Control System as explained in preceding sections. This demands that they engage in collective action during the formative and group maintenance stages, processes that have the potential to impose additional costs on the farmers who have decided to adopt organic farming systems.

4.4 Determinants of collective action

Literature on collective action has focused mainly on theory identifying and explaining factors that promote or discourage effective collective action (Olson, 1965: 166; Ostrom, 1992a; Sandler, 1992:19). Meinzen-Dick *et al.* (2002) contend that emergence of collective action is a complex phenomenon. However, it is conceivable that individual behaviour with respect to collective action is influenced by costs and benefits of participation (Matta & Alavalapati, 2006). Consequently, the evaluation of determinants of collective action in general and the role played by production and transaction costs constraints will shed more

light on the collective action challenges faced by smallholders converting to organic production system.

There is a broad consensus in contemporary NIE literature that successful collective action hinges on four classes of determinants: the characteristic of the collective action problem; the attributes of the group (members and non-members); the attributes of the institutional arrangements and external influences (Sekher, 2001). Adams *et al.* (2003) contend that differences in community members' knowledge and understanding of collective action are due to differing perceptions of the problem and of the best solution to address it. Heltberg (2001) attributes such differences to structural differences such as age, education, gender, occupation, values, beliefs, ideas, and economic status. With regard to the benefits and costs of participating in a certified organic farming group like EFO, members are expected to gain from economies of size that accrue to both farmers and service providers (who avoid coordinating or dealing with a plethora of individual clients) in marketing and training. Importantly, unit certification and monitoring costs fall because certification agencies need only conduct sample inspections rather than inspections of all farmers (Damiani, 2003). To better understand the theoretical underpinnings of the production and transaction costs faced in the organic sector, a brief evaluation of the transaction cost theory and its application in general and to the organic industry specifically is important.

4.5 Transaction cost theory and its application

TCE builds on the original propositions by Coase (1937) that firms and markets are alternative governance structures that differ in their transaction costs. In order for economic activities to take place there must be an exchange of goods or services and accompanying property rights. These market exchanges are not without costs. Transaction

costs are simply the cost of carrying out a transfer of goods between technically separate phases of production or distribution, or simply the cost of carrying out an exchange of goods and services. The presence of transaction costs is reflected by the difference or discrepancy between buying and selling prices (De Janvry *et al.*, 1991). If sellers experience low prices they are discouraged from supplying, and when buyers experience high prices they are discouraged from buying, thereby causing market failure.

According to Coase (1937) and Key *et al.* (2000), transaction costs consist of *ex-ante* and *ex-post* costs. *Ex-ante* costs are largely *fixed* costs including the expense of searching for trading partners, specifying the product to be traded, negotiating price and contractual terms, monitoring the compliance of contractual partners, enforcing the contract, and collecting damages when partners fail to observe their contractual obligations (Eggertson, 1990: 15; Hobbs, 1997). Jaffee and Morton (1994) identified legal, extra legal and physical constraints on the movement and transfer of goods, including handling costs, inspection costs, storage costs, and transport costs as sources of transaction costs. *Ex-post* transaction costs are mainly *variable* costs incurred after the contract has been signed, but before the entire contract is completed. These include risks of late delivery, non-delivery and nonpayment, and the costs of monitoring quality (Casson & Wadeson, 1998).

There are two approaches to the study of transaction costs (Hirsh *et al.*, 1996). The first approach involves taking the transaction costs as explanatory factors for certain behaviour (Williamson, 2000), whereas the second approach views transaction costs as a response variable affected by a range of factors (North, 1990). Since transaction costs are sometimes unobservable, a good number of authors have used household characteristics to approximate transaction costs because market failure is household specific (De Janvry *et*

al., 1991; Goetz, 1992) as well as commodity specific (Delgado, 1999; Grosh, 1994). Several studies have investigated the role of transaction costs in agricultural output and input markets. Goetz (1992) and Key *et al.* (2000), have showed the effect of transaction costs on output markets. Goetz (1992) studied household food marketing behaviour using proxy variables for transaction costs such as cart ownership, distance to market and regional dummy variables. The study found that better access to information significantly raised probabilities of market participation. In another study, Key *at al*., (2000) found that participation in maize markets was affected by both fixed and variable transaction costs. Variable transaction costs were more significant in selling rather than buying decisions.

Hobbs (1997) studied the importance of transaction costs in the choice of marketing channels for cattle. The study revealed that some transaction costs such as grade uncertainty, risk of not selling and time spent at the auction floors were significant variables affecting the choice of either live-ring auction or direct-to-packer sales. In an earlier study, Hobbs (1996) investigated the effect of transaction costs on the supply channel chosen by United Kingdom beef processors. She found that choice of supply channel was influenced by traceability of cattle back to the farm, the extent of cattle handling from farm to abattoir, payment on dead weight carcass grade, and length of relationship with a regular supplier. In their study of costs of contract enforcement in hog markets, Beckmann and Boger (2003) found 'value of relationship' to be a significant determinant of the level of losses a farmer is willing to accept before enforcing a contract through the courts.

A limited number of studies have examined the role of transaction costs in South Africa. Fenwick (1998) assessed the importance of transaction costs as determinants of credit use

by small farm households KwaZulu-Natal. Using an index of variables for gender, education, length of residency, presence of migrant workers, ownership of car and a district dummy, high transaction costs were identified as prohibiting access to credit markets. Matungul (2001) later explored linkages between transaction cost factors and marketing activities in two districts of the same province. Makhura (2001) investigated the effect of transaction costs on household decisions to participate in agricultural markets in the Northern Province. Karaan (1999) described the transaction costs associated with mussel mariculture in Saldhana Bay. The study identified agricultural franchising as the most effective form of vertical coordination that minimised transaction costs.

4.6 Transaction cost theory and the organic sector

There is not much literature dealing with the application of transaction cost economics to organic farming (MacInnis, 2004). Transaction costs of selling in organic markets may be relatively high because organic markets are thin, and necessary institutions and infrastructure are not yet fully developed, even in developed countries (MacInnis, 2004). MacInnis (2004) applied the transaction cost approach in analysing choice of organic marketing channels by farmers in the United States of America. The study found strong empirical evidence that existing organic retail and wholesale markets impose considerable barriers to entry for individual organic farmers, and that the effects of transaction costs are asymmetrical between farmers who transitioned from conventional farming and those who did not with the later facing higher transaction costs.

For smallholders that traditionally use few inorganic inputs in production, decisions to join and to continue participating in a certified organic institutions or groups are influenced primarily by economic and institutional factors. The paradox facing smallholders is that

they face both production and marketing constraints rooted in ill-defined property rights and high transaction costs (Lyne, 1996). North (1990:3) defines institutions as human devised constraints that shape human interactions and ultimately affect the performance of an economy through their effects on exchange and production costs. In the context of organic groups, institutions that effectively reduce production and transaction costs constraints are more likely to endure. Adopting North's (1990) broad definition of total production costs as made up of transformation costs (costs of operating inputs; land, labour and capital) and transaction costs (costs of defining, protecting and enforcing property rights), participation in an organic group imposes ongoing costs, including opportunity costs and risk, on members. Some of the more pervasive costs of collective action include time spent at meetings, negotiating and complying with rules, and providing information to the organisation (Doner & Schneider, 2000).

A model of transaction costs typically faced by organic farmers, farmers in transition, and conventional farmers is presented in Figure 2.1. Household characteristics and incentives created by organic farming groups may cause transaction costs to differ across farming households (Adhikari & Lovett, 2006). In addition to general transaction costs faced by smallholders under conventional farming systems, Figure 2.1 illustrates that farmers who convert from conventional to organic practices must contend with fixed costs of certification and compliance, establishing new market channels, maintaining product identity, learning about organic farming, and the opportunity cost of abandoning crops that have no organic markets to avoid complications in certification (Promar International, 1999).

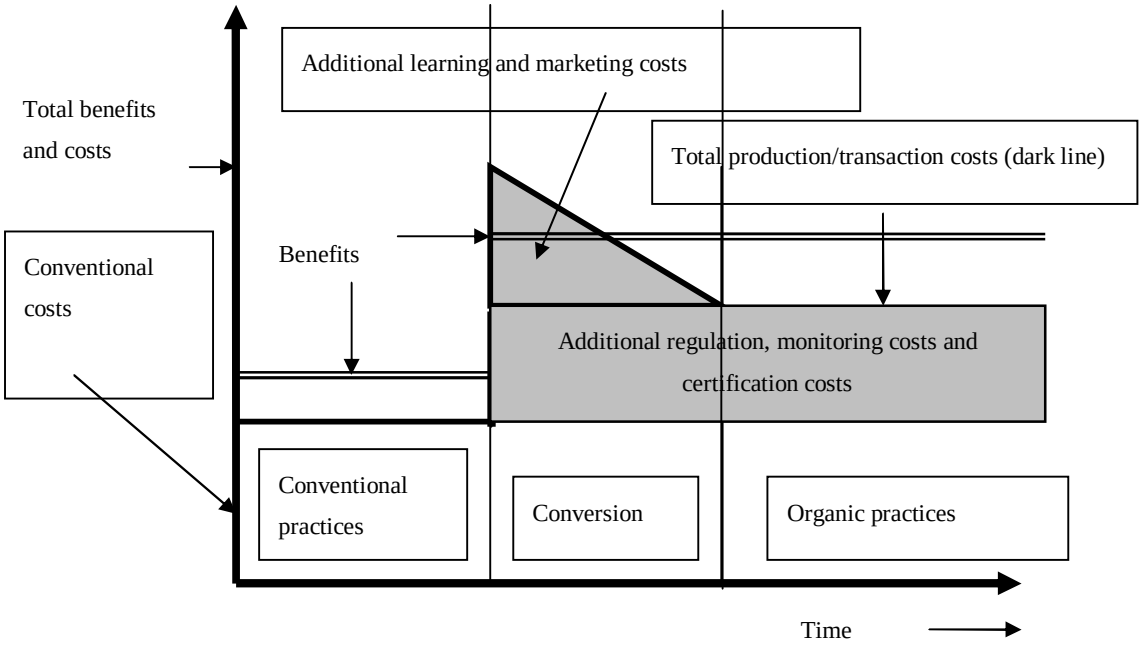

Figure 4.1: Benefits and production/transaction costs for a representative farm

Source: Promar International, 1999.

Productivity levels may decline and existing capital improvements may have little impact on organic output due to rotational constraints, hand weeding, and cover crops that are labour intensive (Damiani, 2003). Together, these production and transaction costs act as a disincentive for conventional farmers to adopt organic systems, and - considering the repetitive nature of significant costs such as compliance and certification costs - for adopters to continue with these systems.

On the one hand, smallholders face high fixed production and transactions costs relative to income when accessing markets individually owing to their small surpluses. It follows that small farmers incur high unit transport, information, and monitoring costs. On the other hand, collective action to dilute these fixed production and transaction costs introduces other costs and is often hampered by problems such as free-riding when farmer groups organise along the lines of conventional cooperatives. Despite powerful conceptual

insights shed by collective action and transaction cost theories, application of both theories remains limited. This study draws on both theories to analyse the role played by EFO in addressing production and marketing constraints perceived by members and non-members. Failure to perceive changes in perceived costs and benefits has collapsed attempts to promote collective action, particularly in poor communities where the costs and benefits tend to be significant (Agrawal & Gibson, 1999).

4.7 Chapter summary

Renewed interest in developmental problems associated with smallholders has focused attention on opportunities presented by organic agriculture. A shift to organic agriculture encompasses institutional, ecological, economic, and agronomic dimensions and more importantly requires that farmers engage in collective action through formation of smallholder organic groups. Collective action requires involvement of a group of people in some common action directed towards achieving a shared interest. Many of the lessons around collective action can be extracted from studies investigating the management of common pool resources.

Collective action remains a difficult issue to measure and analyse empirically. There are no standardised measures or indicators for measuring the existence, viability and effectiveness of collective action. There is broad consensus that the success of collective action depends on the nature of the collective action problem, group attributes, institutional arrangements in place and external influences. The number of organic farming groups has been increasing and IFOAM has played a central role in coming up with criteria to guide group certification. Once a group is formed members encounter additional transaction costs in an attempt to comply with organic certification standards. Some of the more pervasive costs

of collective action include time spent at meetings, negotiating and complying with rules, and providing information to the organisation. If collective action does not yield sufficient benefits to cover for added costs, sustainability of the organic group is in serious doubt.

CHAPTER 5

FREE-RIDING THEORY

This Chapter provides an over view of free-rider problems associated with collective action in organic groups. As explained in Chapter 4, collective action, apart from introducing additional costs, is susceptible to institutional problems such as free-riding, a common phenomenon in the production and distribution of collective goods, which can contribute to the demise of collective action effort. Free-riding is an institutional problem that is difficult to measure and understand and its impact on collection action remains largely unknown. Equally important is the need to identify appropriate institutional measures to counter it. This Chapter outlines the theory underpinning free-riding behaviour in groups and highlights progress made in analysing it empirically. The major determinants of internal group free-riding are then explored in greater detail before putting forward recommendations to mitigate it.

5.1 Problems associated with collective action in organic groups

The issue of smallholders' exclusion from supply chains due to high transaction costs was also noted by Simmons (2002). In many cases, vertical coordination must be preceded by horizontal coordination between smallholders so that agents who sell farm inputs or who buy farm products are not faced with a multitude of small transactions. Poulton and Lyne (forthcoming) argue that horizontal coordination can range from informal agreements between farmers to coordinate purchases and sales, to groups that are formally constituted to facilitate collective action (like farmers' associations and organisations), and ultimately to groups that elect or hire managers (like farmers' cooperatives and investor-owned

firms). The latter represent horizontal integration as opposed to horizontal coordination where collective action still involves some degree of shared decision-making.

While horizontal coordination and integration can reduce transaction costs and improve smallholder access to more reliable markets, group arrangements can introduce costs and institutional problems that discourage smallholder participation and investment such as free-riding. Gadzikwa *et al.* (2006a) examines costs and other determinants of continued participation in EFO and identify free-riding as a potential threat to the group's performance. Ostrom (1992b) and Gripsrud *et al.* (2000) view free-riding as one of three types of opportunistic behaviour, in addition to rent-seeking and corruption, found in many smallholder group institutions. Cook and Illiopolus (1999; 2002) and Sykuta and Cook (2001) highlight the adverse effects of free-riding on the performance of traditional marketing cooperatives and attribute the problem to ill-defined property rights within these organisations.

EFO's constitution entrenches several principles that underpin traditional cooperatives, such as net margins distributed according to patronage, democratic control (one member one vote) and open membership. Membership comprises of fully organic certified farmers who founded the organisation, and partially certified members who joined later and who are transitioning to fully certified status. Unlike a cooperative, EFO has no equity ownership scheme and, therefore, does not offer shares in return for capital invested by its members. The arguments presented by Cook and Illiopolus (2002) seem to suggest that EFO is likely to suffer from collective action, free-rider and contractual problems linked to marketing of its produce because the gains from cooperative action can be accessed by individuals who did not fully invest in creating them.

5.2 Free-riding theory and organic farming groups

The free-rider problem is highly pervasive and often occurs in situations where collective action is required (Esteban & Ray, 2001). Free-riders avoid the full cost of benefits they receive from collective action. Perceptions of free-riding therefore tend to undermine group formation and the productivity of individual group members (Kidwell & Bennett, 1993). Free-riding can be distinguished as external free-riding and internal free-riding. External free-riding occurs when non-members of an organisation cannot be excluded from accessing group membership benefits. Internal free-riding occurs when members abscond from fulfilling membership obligations, but at the same time access full membership benefits. The theory of free-riding is therefore relevant to problems of the commons (Edney, 1980), social traps (Platt, 1973) and social dilemmas (Orbell & Dawes, 1981) and his implications for smallholder organic group formations.

Economists usually assume that individuals are inherently selfish and are therefore likely to adopt free-riding as a dominant strategy in the provision of public goods (Ledyard, 1995). Unlike private goods, public goods are characterised by non-excludability and low rivalry. Between the two extremes of public and private goods are toll goods (low rivalry, high excludability) and common pool resources (low excludability and high rivalry). Groups of organic certified smallholders are often more concerned with these intermediate goods than with the provision of public goods. Some of the services managed by EFO constitute intermediate goods (e.g. storage and transport) while others resemble public goods (e.g. product inspection and market access). Free-rider problems are relevant in both instances and could harm EFO’s ability to provide members with access to a reliable niche market.

The majority of empirical studies of free-riding behaviour have been predominantly experimental in nature, intent on identifying the incidence of free-riding while controlling for social and cultural factors (Andreoni, 1995; Chong, 2001). Some empirical studies have analysed the impact of group size on free-riding in real world contexts, sometimes ignoring other important variables such as group heterogeneity (Naidu, 2005). Chong (2001) noted that the incentive to free-ride is influenced by socio-economic variables and is strongly linked to the nature of the public good.

Organising collective action incurs costs. Rational individuals, acting selfishly, would be unwilling to bear these costs personally if the benefits accrue to free-riders. The influence of group size on free-riding once a group has been formed is a function of noticeability, perceptibility and individual share in the benefits of collective action (Albanese & Van Fleet, 1985). Small group sizes increase the noticeability of free-riders, and members tend to perceive that their contributions will make a difference, inducing contributions from others. In large groups, noticeability of member contributions diminishes and group administrators tend to have less information about each member to verify individual behaviour (Rokkan & Buvik, 2003). Growth in the size of the group is therefore expected to increase the cost of monitoring and enforcing members' contributions, while simultaneously diluting their individual benefits.

In short, members of large collective action groups have greater opportunity to free-ride and less incentive not to free-ride than do members of smaller groups. Olson (1965: 48) contends that the dominant strategy in large groups will be to free-ride in the absence of coercion or selective (e.g. proportional) benefits, but argues that some members may be willing to pay all of the costs themselves if they stand to capture a significant share of the

benefits. Although EFO's constitution does not provide for proportional benefits, it is possible that a skewed distribution of incentives may alleviate some of the adverse effects that a rapidly growing membership is expected to have on its performance. Larger farmers may tolerate some free-riding by smaller farmers as they stand to benefit more from the niche market.

5.3 Empirical free-riding evidence

Most empirical studies of free-riding behaviour have focused on Olson's (1965:34) proposition that an increase in group size encourages free-riding (Sweeney, 1974; Marwell & Ames, 1979; Tillock & Morrison, 1979; Isaac & Walker, 1988; Alfano & Marwell, 1980; Murry & Heide, 1998; Rokkan & Buvik, 2003). The majority of these studies found that group size is positively associated with free-riding tendencies (Sweeney, 1974; Alfano & Marwell, 1980; Isaac & Walker, 1988). However, others (Marwell & Ames, 1979; Tillock & Morrison, 1979) did not – possibly because group size effects may be offset by common goals, a skewed distribution of potential benefits and coercion or institutional arrangements that provide for proportional incentives. For example, the group may organise along the lines of an investor-owned firm (IOF) where shareholders earn dividends and capital gains in direct proportion to their equity contributions (shares).

Free-riding theory also deals with coercion and incentives, particularly in large groups, to assure provision of shared goods. Coercion may include policies and procedures, controls, management directives and threats of expulsion. Special incentives could include shares, personal recognition and bonuses that improve proportionality between individual costs and benefits. A group member's decision to free-ride, according to Stroebe and Frey (1982), is influenced by the net benefit of contributing to a group's activities versus the net

benefit of free-riding, which depends upon the probability of detection and penalties attached to free-riding (Fjeldstad, 2004). Free-riding would be less likely with increased chances of detection and severe penalties. EFO does not enforce a penalty system. For the purpose of this study, individual net benefits are approximated as the difference between average rankings assigned by members to the benefits and costs of participating in EFO. These rankings reflect member perceptions and therefore indicate the relative importance of individual net benefits. For example, a member with high off-farm income might claim lower benefits and higher costs of participating in EFO than would a member who depends heavily on farm income - even if they derive the same absolute net benefit. To some extent, this captures both interest and wealth heterogeneity within the group – factors that influenced cooperation between members of forestry user groups studied by Naidu (2005) in India.

Trust is the level of mutual confidence that group members are dependable and competent (McAllister, 1995), act with integrity (Robinson, 1996), and will care for other members' interests (Mischel, 1973) and not put each other at risk (Jarvenpaa *et al.*, 2004). Higher levels of trust reduce transaction costs (such as the costs of negotiating rules, and monitoring and enforcing compliance) and therefore strengthen incentives to cooperate. Alesina and La Ferrara (2000) contend that individual and socio-economic characteristics (such as education, income, and past experiences) influence how much people trust each other. Dirks (1999) argues that less free-riding is expected where group members trust each other and any external parties central to the survival of the group because it reduces transaction costs and raises individual benefits of collective action.

Clark and Sefton (2001) argue that trust reinforces reciprocity attitudes that reduce free-riding. It therefore follows that higher degrees of trust are associated with greater cooperation (Putman, 1993). This makes trust an important determinant of free-riding behaviour. While acknowledging the importance of trust within a group, this study measures trust in terms of members' perceptions of the integrity of the pack house that buys EFO's organic produce. Following Dirk's (1999) argument, trust in an external party reduces transaction costs and therefore discourages free-riding by raising the individual benefits of collective action.

Boyd (1996) emphasises the role played by information. Free-riding behaviour is closely linked to problems of moral hazard and adverse selection that arise in contracts where asymmetries of information are present. Nabli and Nugent (1989:1337) argue that information asymmetry invites opportunistic behaviour, raising transaction costs and encouraging free-riding. For example, grading procedures agreed upon by EFO and the pack house are flawed because produce cannot be traced to its point of origin (produce is pooled before it is graded by the pack house). The pack house cited costs and time constraints as the major reasons for not inspecting and grading individual produce before bulking. Members who are aware of this flaw might deliberately channel inferior produce through the pack house and so free-ride on (less well-informed) members who supply high quality produce.

The influence of household and context variables on household economic outcomes has been widely explored in the literature (Ehrenberg & Smith, 2000). These variables may indirectly measure constructs such as trust, transaction costs and a member's ability to participate fully in an organisation. Household and personal characteristics identified as

significant determinants of free-riding tendencies include age, gender, family size, and education (Putman, 1993; Wagner III, 1995; Cadsby & Maynes, 1998; Chong, 2001). Wagner III (1995) found race and age to be significant determinants of cooperation in his study of cooperation among students at Michigan State University. Chong (2001) found age, education of household head, and length of association to be negatively associated with free-riding amongst households in the provision of water services in Nicaragua and Guatemala.

Putman (1993) argued that people who have interacted over long periods develop increased cooperation, which may result in reduced free-riding. Although fully certified members of EFO had cooperated for more than four years, reservations about new entrants (partially certified members) free-riding on the effort and capital that they had invested in establishing the organisation and its services could easily offset any gains from cooperating over a long period. Orbell and Dawes (1981) evaluated the effect of free-riding perceptions on group performance in an experimental study and found that members averse to carrying free-riders eventually reduced their effort, a phenomenon known as the ‘sucker effect’ (Kerr, 1983). The preceding discussion demonstrates the important link between collection action and free-ridding, not to mention the need for a better understanding in an attempt to build resilient organic groups.

5.4 Chapter summary

Coordinated purchases and sales reduce the transaction costs for the buyer and groups that are formally constituted to facilitate collective action such as farmer associations and cooperatives introduce additional costs and are plagued by institutional problems that discourage participation and investment such as free-riding. Free-riding, the tendency to

enjoy benefits without paying fully for their creation, can have adverse effects on the performance of smallholder organic groups and is found in organisations with ill-defined property rights. Many studies have identified a number of factors that may contribute to free-riding tendencies. These include information asymmetry in contractual arrangements, lower degrees of trust, low net benefits of participating, context and household variables, and increasing group size. Existence of free-riding in group settings may create sustainability problems and eventually lead to the demise of collective efforts due to the 'sucker effect'.

CHAPTER 6

CONTRACT THEORY

From a NIE perspective, contracts are viewed as governance mechanisms designed to minimise transaction costs. Contract farming is viewed as one form of governance in the vertical coordination continuum, lying somewhere between the spot market and full vertical integration. There are opposing arguments concerning the effectiveness of contracts in linking farmers to high value organic markets. The success of contracts depends to a large extent on the context and appropriateness of contractual arrangements adopted. Farmers collectively working together have a greater chance of clinching contractual deals.

However, improper contractual arrangements may accentuate existing free-riding tendencies or even encourage them where they do not exist. Contract design and structure is therefore important in understanding the functioning of organic groups. This Chapter conceptualises arguments around vertical coordination in supply chain relationships by exploring theoretical and empirical issues around contracts and contractual arrangements in smallholder organic farming systems. It compares theoretical insights shed by the transaction costs and incomplete contract analytical frameworks, reviews empirical studies dwelling on contract design and structure, and demonstrates their relevance to the study of organic farming groups.

6.1 Contractual arrangements in supply chain relationships

Food and agricultural markets tend to be characterised by different forms of coordination including vertical integration and alliances along the agricultural supply chain. At the same

time, increased consumer demands for food safety in fresh produce markets have led to concerns about the ability of small farmers and small agribusinesses in developing countries to comply with stringent food safety requirements (Kirsten & Sartorius, 2002). Interestingly, opportunities for these smallholders lie in product differentiation, organic products, and exploitation of other high value niche markets. Contract farming and its variants (e.g. grower schemes, nucleus or core estate models, satellite farming) are considered a means to integrate small farmers into high value niche markets through provision of technology, ready markets for inputs and products, and stable prices (Weatherspoon *et al.*, 2001) despite criticism that it is another form of exploitation (Glover, 1987). The emergence of contract farming among smallholders has been motivated by the need to address market failures associated with spot markets including poor or imperfect credit and insurance markets, lack of market information, lack of access to production inputs and poorly developed product markets (Key & Rusten, 1999).

Williamson and Scott (1999) identified three classes of contracts that have relevance in determining coordination performance. These are classical, neoclassical and relational contracts. NIE provides a theoretical framework that helps to explain the existence of contract farming, as many problems associated with imperfect and missing markets are caused by asymmetric information and other factors that raise transaction costs (Minot, 1999; Grosh, 1994; Key & Rusten, 1999).

6.2 Theories of contractual relationships

6.2.1 Definition and role of contracts

Bogetoft and Olesen (2002) identify the role of contracts as coordinating a business relationship, motivating compliant behaviour, enhancing performance of contractual

parties, and minimising transactions costs. Every transaction has three basic elements: the allocation of value, the allocation of risk and the allocation of decision rights. A contract is viewed as an institutional construct outlining the mutually agreed rules of how these fundamental elements will be addressed. From a legal standpoint, a contract is a legally enforceable promise. Any contract, whether written or verbal, should specify the responsibilities and obligations of the contracting parties, enforcement procedures and remedial measures in case of a breach. However, from an economic perspective, contracts are viewed as governance mechanisms, outlining expected and agreed upon allocations of value, risk and decision rights associated with transactions, and are necessarily incomplete (Sykuta & Parcel, 2002). Contractual arrangements commonly observed in organic farming groups regulate transactions between the certified group and outside buyers such as pack houses and retailers. This is to synchronise production and processing of highly perishable organic produce.

Contracts between producers and buyers differ in their objectives (Eaton & Shepherd, 2001) and structure depending on the nature of organisations, levels of risk involved, bargaining power and production patterns (Sporleder, 1992). The contract could specify the price (fixed or differential), quantity, provision of inputs and credit, production conditions, delivery mechanisms, and grading requirements (Rusten & Key, 1996). Different types of contracts, ranging from marketing contracts to contracts specifying some measure of buyer control over production, represent different levels of market coordination (Wolz & Kirsch, 1999).

Numerous studies have explored and documented the experience of successful contract farming outside South Africa (Glover & Kusterer, 1990; Tiffen, 1995). Mbongwa *et al.*

(1996), Karaan (1999), van Rooyen (1999), and Sartorius *et al.* (2003), amongst others, have documented some South African contracting experiences. These studies, though not exhaustive, have noted numerous advantages accruing to small contract farmers, such as skills transfer, guaranteed prices and improved access to inputs, services, credit, technology and reliable markets (Glover & Kusterer, 1990; Eaton & Sheperd, 2001). The disadvantages farmers may encounter include increased risk, inappropriate technology, manipulation of quotas and quality, corruption, domination by monopolies, indebtedness and over-reliance on loan advances (Runsten, 1992; Tiffen, 1995; Runsten & Key, 1996). Where contracts exist, they encounter problems of contract enforcement, high unit transaction costs, high demands for consistency, attitudes and ethics encouraging non-compliance, high rates of product rejection by intermediaries, and weak bargaining power of farmers. For example, EFO frequently contest high rates of product rejection reported by the buyer (Gadzikwa *et al.*, 2006b). Such problems may lead to the exclusion of smallholders from contractual relationships (Kirsten & Sartorius, 2002) or to the collapse of contract farming. Local organic farming groups such as Vukuzakhe and Makhuluseni, both in KwaZulu-Natal, failed in their embryonic stages.

Some studies of vertical coordination in agriculture have investigated the impact of contracts on industry structure, particularly the hog and poultry industries (Lawrence, *et al.*, 1997; Harl, 1990, 2000). Goodhue (2000) contends that understanding of contractual issues outside the poultry industry is generally limited, while Sykuta and Parcel (2002) generalise this claim to contract structure itself. South Africa has produced very little research on contract design, or on contract farming outside the sugarcane and timber industries. Organic farming has been gathering momentum in southern Africa over the last decade with South Africa having a robust, but immature organic market in which price

premiums are rare. The South African market is supported by supplies from 45000 hectares of organically certified land made up of 250 commercial farms (Yussefi, 2006). Proponents of contract farming assert that smallholders who cannot finance fertilisers and chemicals, and who are organic farmers by default, encounter minimum conversion costs to high value organic farming (Parrott *et al.*, 2006).

6.3 Contract analytical frameworks

Contractual relationships are analysed differently by Incomplete Contract Theory (ICT) and Transaction Cost Economics (TCE), even though both theories emphasise contract incompleteness. Several propositions to explain the existence of incomplete contracts were explored by Maskin and Tirole (1999). These include lexical limitations that make contracts unclear; bounded rationality that causes economic agents to overlook relevant variables for contract realisation; trade-off between the gain of a new provision and its cost when negotiating a contract; the inability of contracting parties to assign probabilities to many contingencies; and finally, the existence of information asymmetries between contracting parties (Crocker & Reynolds, 1993; Shavel, 1998). However, Saussier (2000a) noted that contract incompleteness is not a problem *per se*, as it does not always involve economic inefficiency, but becomes one as soon as quasi-rent (value conditional on the continuation of a relationship) is created. Contracting parties, therefore, have no assurance that the quasi-rent they create will not be appropriated through opportunistic behaviour when contracts are incomplete.

ICT disregards the concept of bounded rationality in its analysis of contractual relationships. Economic agents are assumed able to foresee all contingencies that affect contracts but are unable to make clear and enforceable contracts owing to non-verifiability

of relevant variables, thereby making information asymmetries the source of incompleteness (Hart, 1995). ICT formalises the hold-up problem emphasised in TCE by suggesting that the party who owns specific assets has the right to decide *ex-post* situations left out of a contract. This induces *ex-ante* investment level inefficiencies as the party that controls residual claims may appropriate all positive surpluses (Hart & Moore, 1999). The crucial problem explored by this ICT's analytical framework is the choice of the property/contract structure that would minimise *ex-ante* investment inefficiency (Saussier, 2000b).

By contrast, TCE theory proposes that contract incompleteness is a result of bounded rationality. Given that a party to a contract may rely on incompleteness to act opportunistically, contractual relationships are therefore an embodiment of cost minimising considerations; i.e. the trade-off between the need to be insured by a contract, especially in case of specific investments, and willingness to adapt the transaction to unplanned circumstances (Williamson, 2000). The contract is viewed not only as an incentive tool to minimise *ex-ante* investment inefficiencies, but also to facilitate *ex-post* adaptation in order to avoid quasi-rent dissipation through inefficient *ex-post* bargaining (Saussier, 2000b). Specific investments are made by members of organic farming groups in that they adopt unique technology to capture the organic value of produce and are unable to secure comparable value in alternative markets. Intermediaries such as the pack house that buys from EFO also have to invest in specific technology and brands that have little value outside organics.

Since it is not feasible to construct a watertight contract that specifies all responsibilities and rights, and which accounts for all contingencies, there are bound to be loopholes that

one contractual party may exploit to the detriment of the other. These loopholes are often present as ambiguities in language or new situations not covered in the contract. Costly or imperfect monitoring and enforcement of contract terms creates an incentive to shirk on contractual obligations. An efficient contract minimises *ex-ante* costs of contract design and negotiation as well as *ex-post* costs of opportunism (Crocker & Reynolds, 1993).

The preceding discussion emphasises that, despite theoretical expositions of perfect contract models, in reality contract design and structure is fraught with problems as argued by Fraser (2005). These include forcing disadvantages on the other party (hold-up) in the formative stages of the contract; one party being better informed about non-verifiable characteristics of the product being exchanged (adverse selection); and one party having imperfect information concerning actions of the other during contract implementation (moral hazard). This implies that contract design and implementation must generate incentives that outweigh these problems. The level and nature of incentives embodied in a contract mirrors the risk that each party is prepared to endure. A typical contract between a group of organic farmers and their buyer should therefore cover the following aspects as postulated by Eaton and Sheperd (2001).

6.3.1 Legal framework

Legal framework refers to the law of contract in a particular country, as well as the manner in which the law is generally used and practised. A contract should be cognisant of prevailing societal attitudes towards contracts and their validity in the presence of political, climatic or personnel changes. Common practices should dictate how detailed contracts ought to be; bearing in mind that a buyer is unlikely to take legal action against smallholders and vice versa as the cost of litigation may well exceed the benefits realised.

However, the need for a contract remains critically important as it spells out clearly the expected relationship between parties.

6.3.2 Contract formula

The formula refers to the circumstances under which a contract operates. Contracts are usually designed for a specific context defined by prevailing market, resource, management and property right arrangements. In general, the contract formula identifies managerial responsibilities, pricing structures and environmental and technical conditions that constrain production and marketing.

6.3.3 Contract format

The format refers to the manner in which a contract is presented. For example, contracts may be formal agreements, simple registrations or verbal agreements. Formal agreements are detailed, legally endorsed contracts that specify obligations in explicit form. They are suitable for large and long-term investments and in cases where land tenure is insecure. Simple registration often characterises centralised models where members of a group are required to complete a registration form that binds them to a collective contract (Watts, 1994). Contracts based on verbal agreements are informal and permit conflicting interpretations of responsibilities and specifications in the absence of clear explanations from management to farmers (Eaton & Sheperd, 2001; Fraser, 2005). Verbal contracts are common in marketing agreements between growers and processors of fresh produce and typically range in duration from six months to a year.

6.3.4 Contract specification

Specifications govern the implementation of a contract. Most contracts specify some or all of the following aspects of an agreement: contract duration, quality standards, production quotas, cultivation practices, delivery arrangements, prices, payment procedures and insurance requirements. Specifications are influenced by the nature of the product, supply reliability, asset specificity, cash flows and quality incentives (Eaton & Sheperd, 2001; Hueth *et al.*, 1999).

6.4 Empirical analysis of contracts in agriculture

6.4.1 Contract farming in practice

In practice, different farming systems and institutional arrangements give rise to different contract farming models. The models can be categorised as centralised, nucleus estate, multipartite, informal, and intermediary. The appropriate model depends on the product, objectives and resources of the sponsor or buyer, and experience of the farmers (Eaton & Sheperd, 2001).

The informal contract model is relevant to the study of EFO. Informal contracts are best suited to farmers who negotiate simple seasonal contracts to sell crops such as fresh vegetables that require minimum processing (Vermeulen *et al.*, 2006). The buyer or sponsor's involvement is normally limited to the provision of key inputs and advice on grading and quality control. The buyer, after purchasing the crop, grades and packages it for resale. Examples of informal models include the government supported production of gherkins in Sri Lanka (Dunham, 1995), production of export bananas, squash and papaya in the South Pacific, and production of chrysanthemums and fresh vegetables in Thailand -

all under verbal contracts (Eaton & Sheperd, 2001). The success of such informal contractual arrangements hinges on the availability of support services. This is particularly critical in Africa where input supply chains weakened following market liberalisation (Shepherd & Farolfi, 1999).

The role of contracts in promoting better industry coordination, improving efficiency and reducing risks associated with agriculture cannot be over-emphasised (Koehler, 1999). Experience gained in the hog industry suggests that the performance of contract farming in the organic industry depends heavily on the length of contracts, right of first refusal on surplus production, financial monitoring and disclosure requirements, and methods of determining prices (Koehler, 1999). Dulce *et al.* (2006) also raised concerns about low levels of trust and commitment hampering hybrid forms of smallholder coordination where verbal agreements are in place. As a result, contractual performance is undermined by tensions, quality and quantity problems, and weak incentives to comply.

6.4.2 Previous studies of contractual arrangements

Ackerberg and Botticini (2002) showed that most empirical applications of contract theory in agriculture regressed contract choice on observed principal and agent characteristics. From a TCE perspective, the main objective of studies by Allen (1985), Eswaran and Kotwal (1985), Hayami and Otsuka (1993), Luporini and Parigi (1996) and Lanjouw (1999) was to identify important determinants of efficient contractual arrangements. Applications of risk-sharing and transaction cost models in agriculture offer little evidence that risk sharing is an important determinant of contract choice, which Ackerberg and Botticini (2002) attribute to endogenous matching. On the other hand, moral hazard,

capital constraints, and multitasking have been identified as important determinants of contractual arrangements (Allen & Lueck, 1992; Laffont & Matoussi, 1995).

Allen and Lueck (1992) examined the use of written versus oral leases for farmland. Formal, written contracts prevailed for land requiring investment in, and maintenance of, irrigation systems. Informal, oral contracts were common where family ties were strong and where there was a history of ongoing relations. Transaction cost studies of contract duration have been conducted largely outside agriculture. Typical examples include Joskow's (1987) study of 300 contracts between coal mines and coal-fired electricity generators, Crocker and Masten's (1988) study of 245 natural gas contracts (which examined the impact of costs and benefits of contracting on the duration of contractual agreements) and Saussier's (1999) study of coal transportation contracts in France.

Contract theory provides no unified structure for specifying and testing design hypotheses (Masten & Saussier, 2000) and contract design varies widely in practice. Major challenges in analysing contract provisions emanate from their discrete and continuous forms. Prices (Joskow, 1988), royalty rates and franchise fees (Bercovitz, 1999), and take-or-pay provisions (Masten & Crocker, 1985) tend to be continuous variables, whereas price adjustment methods are usually discrete (Crocker & Reynolds, 1993).

Provisions that have dominated empirical studies of contract design include incentives, prices, and price adjustment methods. Transaction cost studies of incentive provisions have asked whether contracts align the interests of contracting parties and promote efficient adjustment in the face of uncertainty. Mulherin (1986) in his study of 'take gas' contracts, found take or pay provisions to vary with changes in the value of gas. TCE tends to treat

fixed and variable pricing structures as ways of minimising transaction costs rather than as ways of dealing with moral hazard and risk sharing (Leffler & Rucker, 1991; Allen & Lueck, 1999). Leffler and Rucker (1991) found that fixed payment contracts in forestry harvesting induced buyers to engage in presale quality and quantity verification, whereas per unit pricing led to inefficiencies in harvesting and were prevalent in heterogeneous timber tracks where search costs were higher.

Studies of pricing provisions in contracts for farmland (Allen & Lueck, 1999) and price-adjustment provisions in gas contracts (Crocker & Masten, 1991), procurement of jet engines (Crocker & Reynolds, 1993) and coal transportation contracts (Saussier, 2000a), support the notion that contract design is a trade-off between low specification costs and rigidities that undermine performance in the presence of uncertain outcomes on the one hand, and greater flexibility but higher expected cost of establishing terms of trade *ex post* on the other (Saussier, 2000b).

6.5 Chapter summary

Despite evidence of mixed contract success stories, contract farming does link smallholders to high value niche markets. Its emergence is attributed to attempts at addressing the problems associated with missing markets, market failure, information asymmetry and high transaction costs. Contracts generally differ in their objectives and range from marketing contracts to contracts specifying some measure of buyer control over production. Cases of successful contracting are well documented and benefits accruing to farmers well enunciated. However, problems associated with non-compliance, high demand for consistency, high product rejection and high transaction costs are still

encountered. These problems have the potential to exclude smallholders from contractual relationships.

Contracts can be analysed by ICT and TCE analytical frameworks. ICT explores choice of contract structure that that minimises *ex ante* investment inefficiencies, while TCE views contractual relationships as an embodiment of transaction cost minimising considerations by looking at *ex post* adaptation to counter *ex post* bargaining inefficiencies. It is not feasible to write watertight contracts, as a result, contracts are fraught with hold-up, adverse selection, and moral hazard problems. While useful in shading insights into contractual arrangements, contract theory does not provide a unified approach for testing contract design hypotheses. It is therefore important to assess the impact of perceived contractual terms on contract performance and in addition to identifying the determinants of preferred contract terms.

CHAPTER 7

MODELS OF COLLECTIVE ACTION AT EFO

This Chapter presents information on the study site and data collection methods used. Theoretical and empirical models postulated to analyse collective action are explained followed by a description of variables used to explain collective action at EFO. Lastly, the Chapter presents parameter estimates of the multinomial logit regression model and discusses the results.

7.1 Data collection methodologies

7.1.1 Study site

The study was conducted within the Embo Community in the former Umbumbulu Magisterial district of KwaZulu-Natal province. The Embo region is situated south-east of Durban and consist of five traditional authorities: Embo, Embo-Kwakhabazela, Embo-NkishisiMahla, Embo-Timuni and Embo-Vumakwenza. Following current district municipal boundaries, the study area is at the confluence of four magisterial districts; Ugu, eThekwini, Sisonke, and Umgungundlovu. The area may be described as rural with rugged topography and surrounded by commercial sugar-cane producers. The study site is illustrated in Figure 7.1.

7.1.2 Target group

EFO pools and sells green beans, baby potatoes, sweet potatoes and *amadumbe (taro)* grown individually by its members to a pack house that markets fresh organic produce to a major retail chain. The project received support from the Department of Economic

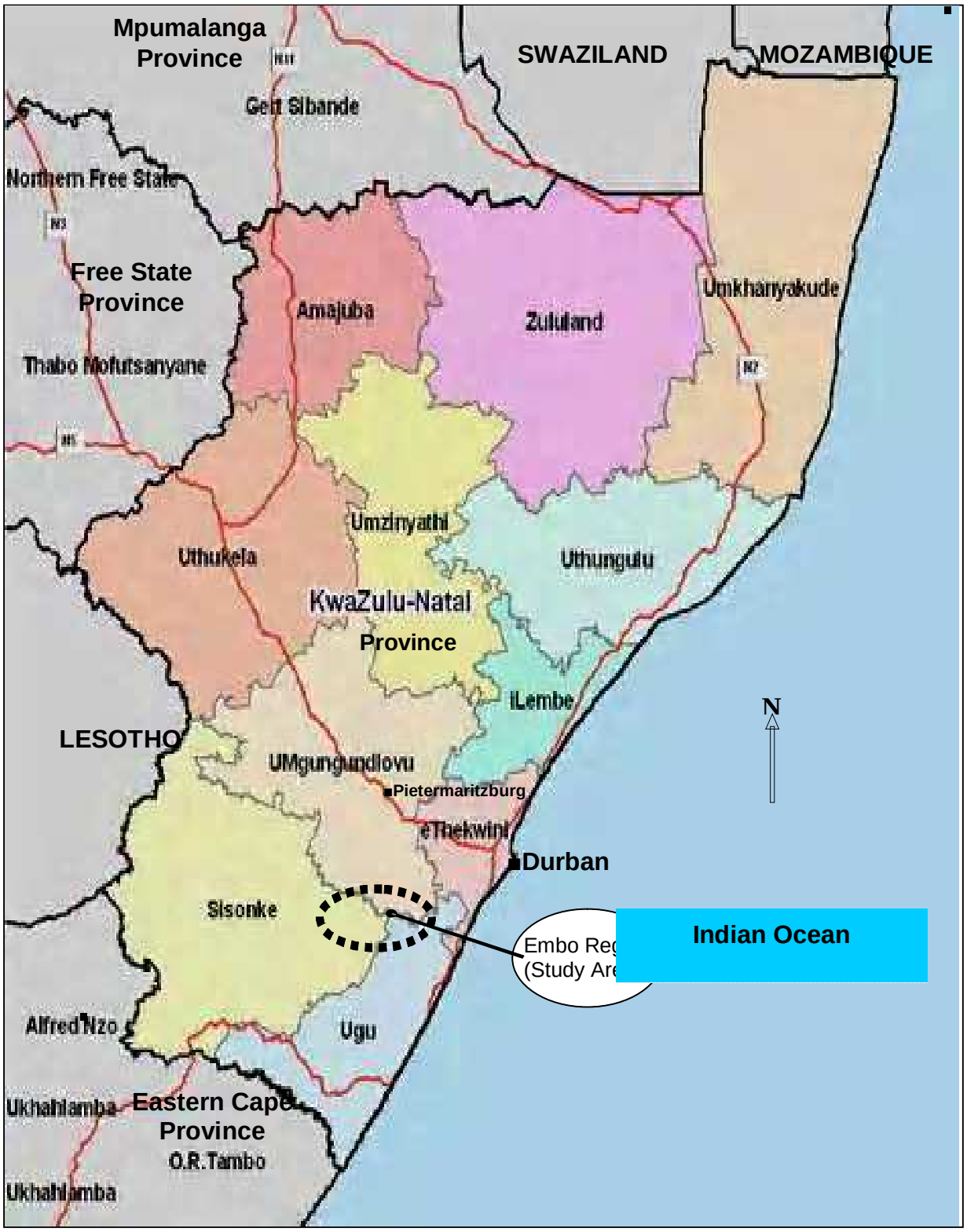

Figure 7.1: Location of study site in KwaZulu-Natal

Source: Municipal Demarcation Board, 2006

Development and Tourism, University of Natal, Woolworths (Pty) Ltd and the provincial Department of Agriculture and Environmental Affairs. The project had originally been established by University of Natal as a participatory research exercise aimed at promoting indigenous vegetable production. EFO started out with 48 members and a contract to supply fresh produce to Pick 'n Pay Stores Ltd. Members were given training and fencing to protect their crops from livestock. In 2003, EFO was certified by AFRISCO and began selling its produce to Woolworths retail chain through a certified organic pack house (Assegai Organics). At the time of this study, the organisation had 151 members. EFO is managed by a committee that is responsible for its day to day operations. The group also had eight internal inspectors to monitor member compliance with organic certification standards.

7.1.3 Survey methods

The study employed two survey designs and data were collected in two phases. First, it drew on a census survey of all 48 fully certified and 103 partially certified EFO members, and second, a stratified random sample survey of 49 non-EFO farmers. The non-EFO respondents represented households whose members did not join the EFO (non-adopters), but who reside in the same area as EFO members. Fully certified members had adopted organic production systems and were certified as such by AFRISCO. Partially certified members were those in the process of converting their production systems to organic ones and had applied for certification. They represented late adopters. Fully certified and partially certified respondents were identified from certification records held at the University of KwaZulu-Natal and a list maintained by EFO's executive committee. Non-members were drawn from lists of households constructed for each of seven neighbouring

wards: Ezigani, Ezimwini, Eziphambathini, Hwayi, upper Ogagwini, Lower Ogagwini and Nungwane.

The first phase applied both a producer and a household questionnaire to EFO and non-EFO respondents during the last quarter of 2004. The first phase producer questionnaire administered to EFO members elicited information about production and marketing of both organic and non-organic crops, marketing constraints, organisational and management issues, organic certification, membership costs and benefits, EFO's constitutional arrangements and compliance with organic certification procedures (Appendix A). The producer questionnaire answered by non-EFO respondents asked similar questions but focused on non-organic crops and farmer's reasons for not joining the organic farming group (Appendix B). The first phase household questionnaire gathered information on household demographic factors, asset profiles, food security, and food consumption patterns (Appendix C).

The second phase of data collection was conducted in the first quarter of 2005. Follow-up producer and household questionnaires were administered. The second phase EFO members' producer questionnaire elicited information on the organic marketing contract, production risks, and market information (Appendix D). Specifically, information was gathered on perceptions of clauses in EFO's contract with the pack house such as contract format, denomination (weight or acreage), delivery options, buyer's call and grading procedures. In addition, questions were asked about preferred contractual terms. The actual terms of EFO's contract were established in interviews with key respondents on the group's management committee.

The second phase household questionnaire focused on food security and consumption patterns (Appendix E). As this investigation was part of a broader research project covering a wide spectrum of issues, only those data relevant to the study of institutional arrangements, free-riding, and contracts were used in testing the study hypothesis. Unfortunately, the buyer refused to participate. The data and its interpretation reflect only what the farmers and other stakeholders revealed and do not in anyway express the views and opinions of the buyer. The following sections present theoretical, empirical, and a discussion of multinomial logit regression results on collective action at EFO.

7.2 Theoretical and empirical collective action models

7.2.1 Multinomial logit model of collective action at EFO

Multinomial regression models are often used to assess the effectiveness of a range of predictor variables in explaining a set of mutually exclusive outcomes. This study used a multinomial logit model to identify predictor variables that explain participation in EFO in collectively marketing organic products. The model distinguishes between participating and non-participating farmers while simultaneously explaining more subtle differences between fully certified and partially certified members. Explanatory variables included in the model extend beyond farm and farmer characteristics to include perceptions of problems reflecting production and transaction costs, and a variable representing the net benefits of participating in EFO's collective marketing action.

The dependent variable (membership status) was a nominal measure taking on (three) arbitrary and unordered values. Such a general unordered multinomial discrete choice problem can be described by the utility theory argument (Mittelhammer *et al.,* 2000).

Suppose the i^{th} farmer's utility derived from EFO membership type (fully certified, partially certified or non-member) can be represented by

$$Y^{*}_{ij} = X_i.\beta_j + \varepsilon_{ij} \quad (1)$$

where, Y^{*}_{ij} represent the expected utility that the i^{th} farmer obtains from choosing the j^{th} state of membership, X_i is a vector of explanatory variables, β_j is a vector of their weights, and ε_{ij} represents the residuals of the utility function. The utility level the farmer obtains from selecting a state of membership is not observable but the membership choices made are. If farmers are rational in their decisions, they should select the state of membership from a possible choice set that maximises their utility subject to resource constraints. Therefore the probability that alternative j is chosen by the i^{th} individual if $Y^{*}_{ij} > Y^{*}_{ik} \quad \forall k \neq j$ and ε_{ij} are independently and identically distributed, each with the cumulative distribution function (CDF) and probability density function (PDF) of

$$f(z) = e^{-z}e^{-z^{-z}} \quad and \quad F(z) = e^{-e^{-z}} \quad (2)$$

respectively is given by:

$$P(Y_{ij}=1) = P(Y^{*}_{ij} > Y^{*}_{ik}), \forall k \neq j$$

$$= P\left[\varepsilon_{ij} - \varepsilon_{ik} \rangle - x_i.(\beta_j - \beta_k), \forall k \neq j\right] = g_{ij}(x_i.\beta_j)$$

$$= \frac{e^{x_i.\beta_j}}{\sum_{j=1}^{j} e^{x_i.\beta_j}} \quad for\ i = 1,...n\ and\ \ j = 1,...J \quad (3)$$

This logistic function is characterised by independence of irrelevant alternatives (Dupraz, *et al.*, 2002). The differences in error terms ($\varepsilon_{ij} - \varepsilon_{ik}$) follow a logistic function in a multinomial logistic model where x_i is a vector of exogenous explanatory variables and β_j are the estimated parameters that weight the exogenous variables to estimate the utility of alternative j. A problem with this model is that the parameter vectors β_j, $j = 1,....J$ are not identified. The identification problem according to Greene (1997) is mitigated by restricting the first parameter vector to zero (i.e. $\beta_1 = 0$) in which case the remaining parameters are identified with resultant multinomial probabilities represented by:

$$p_{ij} = g^*_{ij}(x_i.\beta_j) = \frac{e^{x_i.\beta_j}}{1 + \sum_{j=1}^{j} e^{x_i.\beta_j}}. \quad for \ \ j \geq 2 \tag{4}$$

and

$$p_{ij} = g^*_{ij}(x_i.\beta_j) = \frac{1}{1 + \sum_{j=1}^{j} e^{x_i.\beta_j}}. \quad for \ \ j = 1 \tag{5}$$

which is similar to the binary choice case when $j = 2$. The log-likelihood model estimated is represented by:

$$\ln(L(\beta; y)) = \sum_{i=1}^{n} \left[x_i.\beta_{yi} - \ln\left(1 + \sum_{k=2}^{j} e^{x_i.\beta_k}\right)\right] \tag{6},$$

and the marginal effects of the explanatory variables x_{ij} are derived from equation (1) and are represented by the partial derivative:

$$\frac{\partial p_{ij}}{\partial x_i} = p_{ij}\left[\beta_j - \sum_{k=2}^{j} p_{ik}.\beta_k\right] \tag{7}$$

Alternatively the log-odds are less complicated in functional form than partial derivatives. Normalising on the first alternative choice with $\beta_1 \equiv 0$, the log-odds ratios are calculated as follows:

$$\ln\left(\frac{p_{ij}}{p_{i1}}\right) = x_i.\beta_j. \qquad (8)$$

The other alternatives besides the first one can be normalised using the general log-odds formula:

$$\ln\left(\frac{p_{ij}}{p_{i1}}\right) = x_i.(\beta_j - \beta_k). \qquad (9)$$

7.2.2 Empirical multinomial logit model of collective action at EFO

The empirical model to estimate a respondent's level of participation in EFO was postulated as:

$$\text{MEMB} = \alpha + \beta\text{FFC} + \delta\text{PTC} + \varphi\text{NB} + \varepsilon \qquad 10$$

where MEMB is the dependent variable, scoring a value of 2 for fully certified members, 1 for partially certified members and 0 for non-members.

FFC = vector of farmer and farm characteristics,

PTC = vector of production and transaction cost indicators,

NB = scalar of net benefits of collective action.

The parameters to estimate are α, β, δ, and φ and ε is the error term, assumed to be identically independently (normally) distributed with mean of zero and a variance of σ^2. This empirical model related only to the EFO and therefore excluded variables such as group size and heterogeneity, the quality of institutional arrangements and external influences thought to explain different levels of participation between groups.

7.2.3 Rationalising the empirical model of collective action

Variables representing farmer characteristics included age, literacy, and gender of the respondent (EFO member, or household head in case of non-members). Certain farmer characteristics are proxies for transactions costs encountered in markets and in collective action. For example, younger farmers may face higher transaction costs in alternative markets than older farmers who tend to have stronger social networks. Education can also reduce transaction costs in alternative markets by improving an individual's capacity to assemble and interpret information. In this study, education was approximated by literacy, a dummy variable scoring 1(0) for respondents who could (could not) read and understand English, the *lingua franca* of commerce and business in KwaZulu-Natal (Matungul, 2001). Eckel and Grossman (1998) contend that women are more cooperative than are men. At the same time, rural women in developing countries are thought to face higher transaction costs in markets owing to their lower social standing (Berry, 1993). These views suggest that a dummy variable scoring 1(0) for females (males) should impact positively on participation in EFO. Age and literacy, on the other hand, are unlikely to determine group membership if they reduce (more or less equally) transaction costs associated with both individual and collective action.

Farm characteristics were represented by farm area, family labour and the ratio of farm income to total household income. The latter variable grows with increasing dependency on farm income, raising the opportunity cost of not participating in EFO (Molinas, 1998). The ratio was expressed in log terms to eliminate outliers and was expected to bear positively on participation in EFO. Larger farms are expected to improve a household's ability to produce surplus crops for the market after factoring in rotational and subsistence constraints (Promar International, 1999) and therefore, increase potential earnings from organic production. On the other hand, larger farms also make it feasible for farmers to produce extensive commercial crops such as sugar-cane rather than land intensive organic crops.

Certification of organic crops becomes more complex and costly when they are produced in close proximity to non-organic crops on small areas of land. Certification prohibits the use of pesticides and herbicides, increasing the demand for family and hired labour. It follows that households with more family labour are more likely to participate in EFO. Unlike Molinas (1998) who used family size to approximate family labour, this study excluded migrant workers and children younger than school-going age from the family's stock of on-farm labour, and weighed resident adults over the age of 65 and children under the age of 16 as half adult equivalents. This is to compensate for the loss of productivity from young persons who spend the greater part of their time in school. Adults over 65 years of age are assumed to have reached retirement age and are considered less productive in physical work than those still of working age.

Production and transaction costs were measured in terms of constraints perceived by respondents. Respondents rated each constraint on a Likert-type scale ranging from 1 (no

problem) to 3 (severe problem). Production constraints, including risk, were indicated by the following constraints: crop damage caused by livestock; uncertain prices for crops; more work than the family can handle; lack of cash and credit to finance inputs; a lack of affordable operating inputs; and tractors not available when needed. Households perceiving these production constraints as severe problems were expected to participate in EFO to counter them.

These constraints are relevant to EFO because the farmers are located in an area with no planned grazing and farming zones. Livestock grazes on fallow land in between cultivated lands, thereby increasing the risk of crop damage by livestock. Price volatility in the local produce markets could be a major concern because prices are neither fixed nor stable thereby increasing farmers' exposure to price risk. The demand for labour is assumed to differ across different farming systems. Naturally, organic farming prohibits the use of synthetic chemicals to control weeds and pests forcing farmers to rely on labour to do most of the tasks. An organic farming system is expected to impose a considerable demand on family labour resources when compared to a conventional production system.

Smallholders are generally under resourced, lacking cash and with limited access to credit. Access to credit is further complicated by lack of formal production and marketing records and absence of collateral. As a result, lenders are reluctant to advance loans to smallholders due to perceived high loan default risks. Another production constraint assumed relevant to the study is the inability of smallholders to access affordable production inputs. Given that these are low-tech production system, the use of external inputs is low, but accessing tillage services could be a serious constraint.

Transaction cost constraints were measured by a lack of crop production information, lack of affordable transport for products, and a lack of telephones to negotiate transactions. The assumption is that crop production information is not easily available to the farmers and government extension services have capacity constraints to adequately serve the farmers. The state of rural infrastructure always poses a challenge to rural producers. Without a reliable transport system, farmers are likely to incur high transport costs in moving their produce to the market. This is compounded further by lack of communication infrastructure to effectively link farmers with markets. For example, a lack of affordable transport will amplify transaction costs if it constitutes a severe problem, and this was expected to encourage participation in EFO in order to dilute transport costs.

Farmers incur substantial costs on their way to becoming a fully certified member of the EFO. Candidates accepted by EFO's selection committee face the onerous task of completing a formal application for organic certification to AFRISCO. Applicants must submit detailed land use plans and historical production information along with their certification fees. Fortunately for EFO, certification fees had been fully subsidised by the Department of Economic Development and Tourism and applicants had been able to draw on research staff at the University of KwaZulu-Natal for assistance in preparing their documentation. Nevertheless, EFO members were obliged to pay annual membership fees and to participate fully in all group activities.

Information about the costs of collective action was captured by asking respondents to rate the burden of membership fees, their time spent at meetings/group activities, additional work effort in crop production, increased expenditure on hired labour, and other operating inputs on a Likert-type scale ranging from 1 (none) to 4 (severe). These scores were then

averaged to compute a composite ‘cost score’ for each respondent. The total composite ‘cost score’ for each respondent ranged from a minimum of 5 to a maximum of 20. The expectation is that organic group members are required to pay annual membership to meet the costs of running their organization and commit more of the scarce time to the organisation by attending meetings, workshops, training and many other group activities. As explained in the preceding paragraph, organic farming is likely to incur increased labour and other additional input costs.

EFO membership provides material benefits. These include: provision of fencing to protect crops from stray livestock; better access to tractor services; better access to information about organic crop production; access to reliable markets; better prices for crops; better access to inputs; subsidisation of organic certification fees; and a voice to lobby for support. Several benefits are subsidised by outside parties, especially the Provincial Departments of Agriculture, Transport, and Economic Development and Tourism. Information about the benefits of collective action was elicited by asking respondents to rate EFO’s performance in realising expected gains on a Likert-type scale ranging from 1 (none) to 4 (major). These scores were then averaged to compute a composite ‘benefit score’ for each respondent, which ranged from a minimum score of 8 to a maximum score of 32 from which the composite ‘cost score’ was subtracted to yield a ‘net benefit’ score. The expected range of ‘net benefit scores’ was a minimum of -12 for members perceiving low net benefits and a maximum of 27 for those perceiving high net benefits. For non-members, the net benefit of joining EFO is assumed to be zero otherwise they would join EFO as did the partial adopters. Consequently, this variable returned zero (0) for non-members, and increasing scores are expected to favour participation in EFO.

7.2.4 Farm and farmer characteristics

Table 7.1 summarises descriptive statistics for explanatory variables used in the multinomial logit regression model. Quantitative variables were expressed as averages, whereas the gender and literacy dummy variables were reported as percentages.

Table 7.1: Farm and farmer characteristics and the net benefit of collective action, EFO, KwaZulu-Natal, 2004/5

Variables		Membership status		
		Non-EFO member	Partially certified	Fully certified
		n=49	N=103	N=48
Age (years)		52.65	48.80	52.71
Gender	Female (%)	83.67	71.84	81.25
Read English	Yes (%)	22.45	27.18	25.00
Farm area (ha)		0.79	0.56	0.65
Family labour (adult equivalents)		3.02	4.07	4.23
LN(farm income/total income)		-6.88	-6.03	-3.16
Net benefit score		0.00	4.02	7.40

The average age of respondents was generally high (around 50 years) but lowest for partially certified members (late adopters). Female representation was high in all of the groups but (unexpectedly) lowest (71.8%) in the partially certified group. Overall, these findings were consistent with previous studies in the province that estimated the average rural household head to be roughly 60 years of age (Matungul, 2001) and that found that most *de facto* heads were female (Marcus, *et al.*, 1995). The proportion of respondents able to read and understand English was very low, ranging from 22.5% amongst non-members to 27.2% for partially certified members. EFO members appeared to farm more intensively than do non-members. On average, they had smaller farms, more family labour and earned a greater share of total household income from farming. Farm income included remittances received by the household, but excluded social transfer. As might be expected, fully certified members had the highest net benefit score.

7.2.5 Production and transaction cost indicators

Table 7.2 presents the average scores computed for production and transaction cost indicators. The range of possible scores for each of the production and transaction cost indicators in Table 7.2 is 1 to 4. Any scores below 2 indicate minor problems, whereas any scores above it indicate serious to severe problems. Table 7.2 provides an indication of how the different farmer categories perceived similar production and transaction cost constraints. Non-EFO members assigned more weight to problems of crop damage caused by livestock, uncertain product prices and lack of technical information than did fully certified members. Conversely, fully certified members were more concerned about labour shortages than were non-members.

Table 7.2: Mean scores of production and transaction cost indicators, EFO, KwaZulu-Natal, 2004/5

Production and transaction cost indicators	Membership status		
	Non- EFO member	Partially certified	Fully certified
	n=49	N=103	N=48
Crop damage caused by livestock	2.80	2.76	2.51
Uncertain prices for crops	2.17	1.93	1.96
More work than the family can handle	2.53	2.26	2.63
Lack of cash and credit to finance inputs	2.78	2.54	2.77
Lack of affordable operating inputs	2.51	2.46	2.83
Tractor not available when needed	2.46	2.70	2.92
Lack of crop production information	2.16	2.17	1.96
Lack of affordable transport for products	2.06	2.37	2.74
Lack of telephones to negotiate transactions	2.22	2.63	2.54

While these differences in group means were consistent with expectations it is clear that others were not. For example, EFO members assigned more weight to transport and tractor problems than did non-members. The multinomial logit regression model estimated the partial effects of these variables on continued membership participation at EFO.

7.2.6 Marginal effects of explanatory variables

Table 7.3 presents the marginal effects of each explanatory variable estimated by the multinomial logit regression model when the non-membership category (Y=0) and partially certified group (Y=1) were compared to the default full membership group (Y=2). Numeracy problems identified in the data set were eliminated, first by reducing the number of categories in the production and transaction costs constraints variables from three to two (converting them into dummy variables) by merging the 'no problem' and 'moderate problem' categories into a 'moderate problem' = 0 category, and second by dropping variables causing perfect separation of the dependent variable. Variables causing quasi and perfect separation of the dependent variable included the respondent's rating of problems such as inadequate storage facilities, a shortage of manure to purchase, and a lack of access to more cropland.

These variables did not contain sufficient variation within the three groups being compared and were excluded from the model. A comparison of the estimated multinomial logit model with and without independent variables as shown by the goodness-of-fit statistic (χ^2 = 138.7) is statistically significant at the 1 per cent level of probability. The predictive power of the model is assessed by comparing predicted and actual group membership. The proportional, by chance, accuracy criterion for the model of 49.4% is satisfied, given the model's overall classification rate of 74.3%.

Table 7.3: Marginal effects of the explanatory variables on collective action, EFO, KwaZulu-Natal (N=200), 2004/5

	Non-members (Y=0)				Partially certified members (Y=1)			
Variables	**Marginal Effects**	**Standard Error**	**Asymptotic t-statistic**	**Exp(B)**	**Marginal Effects**	**Standard Error**	**Asymptotic t-statistic**	**Exp(B)**
Intercept	0.265	1.614	0.164		0.132	1.339	0.099	
Age (years)	-0.001	0.029	-0.034	0.999	-0.019	0.024	-0.802	0.981
Farm area (ha)	-0.541	0.384	-1.409	0.582	0.035	0.252	0.14	1.036
Net benefit	-0.375***	0.085	-4.412	0.687	-0.166***	0.054	-3.078	0.847
Family labour (adult people)	-0.158	0.169	-0.935	0.854	-0.075	0.12	-0.621	0.928
LN(Farm income/Total income)	-0.641***	0.157	-4.083	0.527	-0.458***	0.134	-3.416	0.633
Gender (Female=1, Male=0)	-0.028	0.834	-0.034	0.972	-0.178	0.707	-0.252	0.837
Read/understand English- (No=0, Yes=1)	0.509	0.94	0.541	1.664	0.373	0.812	0.459	1.452
Crop damage caused by livestock (moderate problem=0, serious problem=1)	0.390	0.848	0.460	1.477	1.218*	0.735	1.656	3.380
Uncertain prices for crops (moderate problem=0, serious problem=1)	0.766	0.844	0.908	2.151	-1.491**	0.707	-2.107	0.225
More work than the family can handle (moderate problem=0, serious problem=1)	-0.269	0.735	-0.366	0.764	-0.505	0.568	-0.889	0.604
Lack of cash and credit to finance inputs (moderate problem=0, serious problem=1)	0.636	0.994	0.640	1.889	0.593	0.817	0.726	1.809
Lack of affordable operating inputs (moderate problem=0, serious problem=1)	-1.381	0.854	-1.617	0.251	-1.254*	0.677	-1.853	0.285
Tractor not available when needed (moderate problem=0, serious problem=1)	-1.104	1.11	-0.995	0.332	-0.715	1.001	-0.714	0.489
Lack of crop production information (moderate problem=0, serious problem=1)	1.729**	0.853	2.027	5.635	1.809**	0.743	2.434	6.104
Lack of affordable transport for products (moderate problem=0, serious problem=1)	-0.409	0.856	-0.478	0.664	-1.455**	0.658	-2.211	0.233
Lack of telephones to negotiate transactions (moderate problem=0, serious problem=1)	-0.924	0.848	-1.090	0.397	0.885	0.679	1.303	2.423

Notes: 1 The reference category is fully certified members. 2 Marginal effects with asymptotic t-statistics greater than unity are boldfaced.3 Statistically significant at: * 10%, ** 5% and *** 1% levels of probability.

The estimated model correctly classifies 83.3% of partially certified members, 71.4% of fully certified members, and 54.3% of non-members. Statistically significant explanatory variables are asterisked in Table 7.3. Significance testing is based on the likelihood ratio and therefore detects a significant overall relationship between the independent and dependent variables. Among the farm and farmer characteristics, only the coefficients estimated for the opportunity cost of not participating in EFO (LN[farm income/total household income]) and the net benefit of collective action were statistically significant. Contrary to Eckel and Grossman's (1998) suggestion that women are more cooperative than men, and Wynn *et al's.* (2001) finding that age is a significant determinant of collective action, neither gender nor age was a significant determinant of the three membership categories considered in this study. Although the coefficients estimated for farm area were not statistically significant, there is some evidence (asymptotic t-value ≥ 1) that households with larger farms opted for less intensive conventional farming systems.

Growth in the net benefits of collective action favoured fully certified membership of EFO. An increase in net benefits reduced the likelihood of being a non-member by more than it reduced the likelihood of being a partially certified member of EFO. The implication is that partially certified members perceived some net benefits in participation despite high costs and meagre returns experienced during the conversion period (Damiani, 2003).

The coefficients estimated for the opportunity cost of not-participating in EFO were both statistically significant and indicate that the chances of participating fully in EFO increased as farming's share of household income grew. However, it is important to recognise that the level of income may influence collective action for different reasons. Verba *et al.* (1995) found that wealthier rural households are more likely to be organised at the expense

of households that cannot afford the investments demanded by organisations**.** This study did not examine the impact of absolute levels of income or wealth on continued participation so it can be inferred only that members are more likely to remain with EFO if they had relatively fewer options to exit the organic farming group.

With regard to production and transaction costs, only the dummy variables indicating crop damage caused by livestock, uncertain crop prices, lack of affordable operating inputs, lack of crop production information, and a lack of affordable transport for products were significant determinants of group membership. Members of EFO who rated livestock as a serious threat to their crops were more likely to be partially certified than fully certified, an apparent reference to the fact that fencing materials had been donated to the early adopters but not to late adopters.

Farmers face price uncertainty, particularly in spot markets for perishable products. This creates an incentive for small farmers to join groups that can bulk up and enter into forward contracts on behalf of their members (Delgado, 1999). Perceptions of price uncertainty contributed significantly to differences between partially and fully certified members of EFO. Fully certified members were more concerned about price volatility in conventional fresh produce markets than were partially certified members. This finding may be a symptom of poor synchronization between harvesting and the buyer's call for deliveries that encouraged fully certified members to direct their relatively larger output into conventional markets.

The coefficients estimated for 'lack of affordable operating inputs' both had asymptotic t-values much larger than unity and suggested that the odds of fully certified membership

increase when this problem is considered to be serious. While it is true that organic farming has reduced options for management strategies to maintain soil fertility and control weeds, pests, and diseases (Mackay *et al.,* 2002), and restricts farmers to organic inputs (including commercial organic fertilizers that are relatively expensive), this finding suggested that EFO members of long standing have not realised any meaningful price discounts for operating inputs.

The odds in favour of being a fully certified member decrease when 'lack of crop production information' is rated as a serious problem. This finding was anticipated because fully certified members benefited from information about organic farming sponsored by government and partners such as the University of KwaZulu-Natal over a relatively long period of time. Collective action improved access to information, so encouraging continued participation in EFO.

Lack of affordable transport to ferry produce to markets was a significant determinant of group membership, distinguishing partially and fully certified members. Contrary to expectations, perceptions of serious transport problems increase the odds of being a long-standing member of EFO. It would seem that EFO has not been able to dilute transport costs, despite having access to a subsidized (but unreliable) government truck. This raised fundamental concerns about EFO's long-term success.

Although the coefficients estimated for 'lack of telephones' were not statistically significant for either non-members or partially certified members, their asymptotic t-values exceed unity in both cases. The opposing signs of the coefficients suggest that perceptions of serious communication problems tend to increase the odds of both fully and partially

certified EFO membership. In other words, EFO may not have invested sufficiently in telephones, fax machines and postal services to attract new members or to encourage continued participation in the organisation.

7.3 Chapter summary

Collective action observed in EFO gave smallholders access to an organic market, primarily by spreading the fixed costs of organic certification. The extent to which a farmer remains interested in collective action is a function of the perceived benefits and costs of doing so. The empirical model has shown that farmer characteristics such as age and gender are poor indicators of continued participation in organic groups. However, growth in the net benefits of participation has a positive bearing on participation while increases in farm size and non-farm earnings (relative to farm earnings) reduces the chances of continued participation.

Consistent with theory, collection action in EFO has positively contributed towards a reduction in some production and transaction costs, while having no meaningful impact on others. The results suggest that EFO has reduced fully certified members' concerns that crops would be damaged by livestock or constrained by inadequate technical information. Transactions costs associated with price uncertainty in conventional markets, lack of affordable operating inputs, lack of affordable transport, and a lack of communications infrastructure remain a problem. These problems, unless addressed, may lead to farmers leaving EFO.

CHAPTER 8

EMPIRICAL FREE-RIDING MODEL AT EFO

The threat of free-riding could potentially lead to the collapse of groups characterised by ill-defined property rights. While literature has attempted to explain factors promoting free-riding tendencies, studies attempting to measure it are generally lacking. This Chapter develops a measure of free-riding and proposes an empirical model for identifying its significant determinants. Specifically, it presents the empirical models and a description of variables used to measure and analyse free-riding at EFO. The threat of a free-rider problem at EFO is illustrated, accompanied by a discussion of parameters estimated for the index of free-riding and model explaining internal free-riding. Evidence of serious free-riding would suggest that EFO should change its institutional rules to better align individual costs and benefits.

8.1 An empirical model of free-rider behaviour at EFO

The study used principal components analysis (PCA) to construct an index from three related measures of free-riding. PCA is a data reduction technique that is often used to investigate relationships between variables (Doll & Chin, 1970; Essa & Nieuwoudt, 2003) and to construct uncorrelated indexes of correlated variables (Nieuwoudt, 1972; 1977).

PCA achieves parsimony and reduces dimensionality by extracting the smallest number of principal components (PC_i) that account for most of the variation in the original multivariate data set and summaries the data with little loss of information:

$$PC_i = \sum_{j=1}^{p} a_{ij} x_j, \quad i = 1,2,...,p \tag{11}$$

where x_j were the p variables under study. The coefficients α_{ij} were computed such that the first principal component or index (PC_1) accounts for the largest share of variance in the original x_j as is possible, and the second index (PC_2) was chosen to be uncorrelated with the first and to account for the largest possible share of the remaining variance, and so on (Nieuwoudt 1977). PC_i with eigen values smaller than unity could be ignored as they account for less variation than do any of the original x_j. In this study, the first principal component had an eigen value of 1.63 and accounted for 54% of the variation in the original x_j (Section 8.3). This index (labelled FRINDEX) was used to compute a free-riding score for each member of EFO. Descriptive statistics computed for FRINDEX (Section 8.3) shed light on the prevalence and depth of free-riding within the organisation.

Free-riding could have been measured directly as the proportion of each member's produce rejected by the pack house, but produce delivered to the pack house could not be traced back to individual growers. Instead, three alternative variables were used to construct the composite measure FRINDEX. Two of these variables (attendance at meetings and pack house sales expressed as a proportion of total organic sales) were directly observable measures of free-riding, while declared willingness to contribute to investments was a subjective measure of free-riding within the organisation.

At the time of the survey a total of 11 monthly meetings had been called by EFO since the beginning of 2004. All partially certified members had joined EFO prior to the beginning of 2004 and were obliged to attend the same number of meeting as fully certified members. The majority of decisions that affect members were taken at these monthly general

meetings. This study viewed non-attendance of monthly meetings as shirking and therefore as an indicator of free-riding by the member. The share of pack house sales in total organic sales was treated as an inverse measure of free-riding by members who divert their better quality produce to other markets and benefit from non-traceability of low quality produce rejected by the pack house.

With regard to the subjective measure of free-riding, members were asked if they would be willing to contribute capital to the organisation in order to finance shared improvements such as storage facilities. A 'no' answer was viewed as an indictor of free-riding by members faced with non-proportional benefits and a 'horizon' problem. The horizon problem has been analysed in the context of traditional marketing cooperatives (Cook & Iliopoulos 1999, 2002; Sykuta & Cook 2001). This problem is caused by residual claims that do not extend as far as the economic life of the underlying asset (Porter & Scully 1987). Under these conditions, members tend to under-invest in long-term and intangible assets because they cannot realise capital gains by retiring shares at their market value. New members become free riders as they benefit from past investments without paying fully for them in the form of higher share prices. EFO's constitution does not assign tradable (benefits and voting) rights to members and therefore exposes members to a free-rider problem that discourages investment.

8.2 Rationalising the empirical model of free-riding

The study hypothesises that FRINDEX scores computed for each member could be explained by the net benefit score described in Section 7.2.3, the member's level of trust in the buyer, asymmetric information, group size effects and personal characteristics. An increase in net benefit score is expected to reduce free-riding.

Members' perceptions of trust between EFO and the pack house were measured on a Likert-type scale of 1 (no trust) to 4 (strong trust). Following Dirks (1999), it was anticipated that members with higher perceptions of trust would be less inclined to free-ride. The presence of asymmetric information, which is expected to aggravate free-riding, was indicated by a dummy variable scoring one if the respondent is aware of the flawed grading procedures, and zero otherwise.

Information about changes in group size cannot be observed directly in a cross-sectional survey of one group. Instead, information about group size effects was captured indirectly by eliciting members' perceptions of how an increase in group size would impact on EFO's performance. A dummy variable was constructed, scoring one if the respondent thought the group's performance would get weaker with increasing group size, and zero otherwise. Members' age, education, gender, certification status (a proxy for experience), and family size were included as explanatory variables to capture the impact of personal and household characteristics on free-riding scores. No *a priori* predictions were made about the direction of impact that these variables might have on free-riding behaviour given ambiguous theory and mixed results from previous studies. Nevertheless, they could influence perceptions of trust, costs, benefits and ability to participate, and hence levels of free-riding. The following OLS regression model was estimated for the free-riding model.

$$FRINDEX_i = \alpha_0+\alpha_1X_{1i}+\alpha_2X_{2i}+\alpha_3X_{3i}+\alpha_4X_{4i}+\alpha_5X_{5i}+\alpha_6X_{6i}+\alpha_7X_{7i}+\alpha_8X_{8i}+ \alpha_9X_{9i} +\mu_i \qquad (12)$$

where $FRINDEX_i$ = principal component score computed for the *ith* member in standardised units,

X_{1i} = age of the *ith* member in years,

X_{2i} = gender, a dummy variable scoring 1 if the *ith* member was female, and 0 otherwise,

X_{3i} = education of the *ith* member in years of formal schooling,

X_{4i} = the *ith* member's family size,

X_{5i} = certification status, a dummy variable scoring 1 if the *ith* member was fully certified, and 0 if partially certified,

X_{6i} = group size effects, a dummy variable scoring 1 if the *ith* respondent thought the group would get weaker with increasing group size, and 0 otherwise,

X_{7i} = asymmetric information, a dummy variable scoring 1 if the *ith* respondent was aware of flawed grading procedures, and 0 otherwise,

X_{8i} = net benefit score,

X_{9i} = trust score, a categorical variable ranked from 1 to 4 with increasing levels of trust.

8.3 Prevalence and depth of free-riding

Table 8.1 presents descriptive statistics for the variables used to compute FRINDEX, a free-riding index for EFO members. On average, members had attended only slightly more than half of the monthly meetings held since the beginning of 2004, and less than 38% of sales were channelled through the pack house. These directly observable variables suggest that group performance is constrained by free-riding. The subjective preferences expressed by members painted a less gloomy picture of free-riding within the group. Two-thirds of

the members stated that they would be willing to contribute towards the cost of shared improvements (INVEST).

Table 8.1: Variables used to compute free-riding index (FRINDEX), EFO, KwaZulu-Natal (N=151), 2004/5

Variables	Unit	Mean	Standard error
Number of monthly meetings attended (MEETINGS)	#	6.16	3.27
Willing to contribute towards group investments (INVEST)	%	66.89	47.22
Pack house sales as a proportion of organic sales (SALES)	%	37.36	41.35

Principal components were extracted from the correlation matrix computed for the variables in Table 8.1. This implies that the component coefficients (α_{ij}) are standardised and therefore indicate the relative contribution of each variable to the principal component. Only the first principal component had an eigen value large enough (1.634) for it to be considered as an index of free-riding. This component accounted for 54% of the total variation the data – similar to the 57% reported by Naidu (2005) for his index of cooperation amongst users of common pool forests in India. The first principal component was computed as:

$$FRINDEX_i = -0.782(MEETINGS_i^*) - 0.702(INVEST_i^*) - 0.729(SALES_i^*) \quad (13)$$

where the asterisks denote standardised variables.

These variables contribute almost equally to the index as the coefficients are all of similar magnitude. Following the arguments presented in Chapter 5, FRINDEX can be interpreted as a positive measure of free-riding. Index scores range from -1.68 for the member least

guilty of free-riding to 1.91 for the member free-riding most. Figure 6.1 illustrates the distribution of scores on FRINDEX after being classified into four categories with equal intervals.

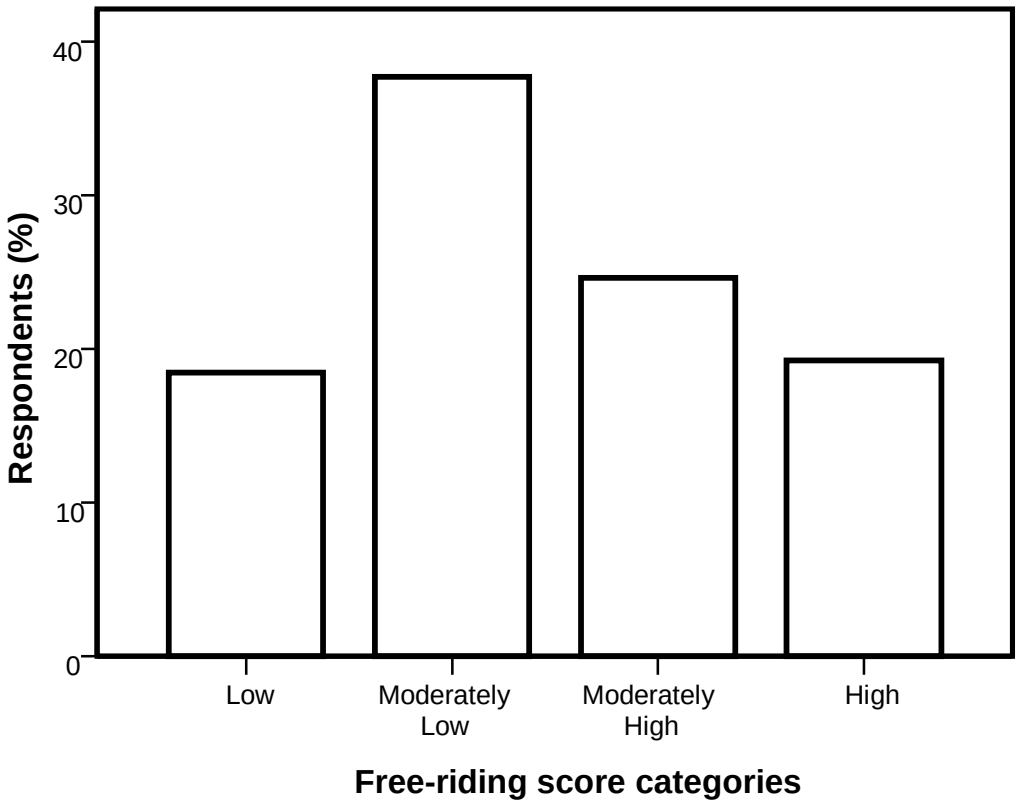

Figure 8.1: Distribution of free-riding scores at EFO, KwaZulu-Natal (N=151), 2004/5

The modal free-riding category is 2 (‘moderately low’) with more than 43% of the cases above it, suggesting that a substantial share of EFO’s members are free-riders. However, as explained in Section 5.2, it is important to establish which members are free-riding as free-riding by ‘small’ members is assumed to be less damaging for group performance than is free-riding by ‘large’ members. Larger farmers stand to benefit more from collective

marketing than do smaller farmers, and may therefore tolerate some free-riding by small farmers. A cross-tabulation of the categorised index scores with categorised farm sizes revealed that the largest farmers (>2 hectares) are also those with the largest index values as shown in Table 8.2.

Table 8.2: Cross tabulation between free-rider and farm size categories at EFO, KwaZulu-Natal (N=151), 2004/5

	Free-riding score categories				Total
Farm size (Ha)	**Low**	**Moderately low**	**Moderately high**	**High**	
< 1	21	42	22	19	104
1.001 through 2	3	4	3	4	14
2.001 through 3	0	0	3	1	4
>3	0	0	3	0	3
Total	24	46	31	24	125

The chi-square statistic was statistically significant (χ^2=11.9, p=0.008) indicating a positive relationship between farm size and free-riding. The implication is that free-riding could well constrain EFO's performance. While it is not possible to make definitive statements about the incidence of free-riding at EFO, it is clear that free-riding occurred amongst larger farmers whose participation is assumed essential for group performance, and that variation in FRINDEX can be exploited to identify significant determinants of free-riding.

8.4 Descriptive statistics of the explanatory variables

Table 8.3 presents descriptive statistics computed for the explanatory variables in the regression models. Variables such as age, gender, education, and net benefit score have already been presented in Section 7.2.4 as averages of each membership category. These variables are repeated in Table 8.3 and in subsequent analyses computed as averages of

EFO members only. The average age of EFO membership was 50 years, and the majority were women (75%). The mean level of education among EFO members was low at 4.61 years of formal schooling.

Table 8.3: Descriptive statistics of explanatory variables of free-riding, EFO, KwaZulu-Natal (N=151), 2004/5

Variables	Unit	Mean*
Age	Years	50.05 (13.94)
Gender (female =1)	%	74.83
Education (years of formal schooling)	Years	4.61 (4.41)
Family size	#	8.36 (4.37)
Certification status (fully certified =1)	%	31.79
Group size effects (group gets weaker =1)	%	5.96
Asymmetric information (present =1)	%	45.70
Net benefit score	#	5.96 (6.57)
Trust score	#	2.58 (0.25)

* mean values with standard errors in parenthesis.

About 6 per cent of the members perceived a negative correlation between increasing group size and group performance. The net benefit score, which ranged from negative eight to positive 22, averaged 5.96. Less than half of EFO members were aware of the flawed grading procedures. The trust score had a mean value of 2.58 and a standard error of just 0.25 indicating that few members reported strong feelings of trust or distrust in the buyer.

8.5 Determinants of free-riding

Table 8.4 presents the results of the OLS regression model to test for the determinants of free-riding at EFO. The model is statistically significant and explains 41% of the variation in FRINDEX, a relatively ‘good fit’ for a model estimated from cross-sectional data.

Table 8.4: Marginal effects of explanatory variables on free-riding, EFO, KwaZulu-Natal, 2004/5

	Dependent variable = FRINDEX		
Explanatory variables	**β**	**Standard error**	**t-value**
Constant	2.742	0.589	4.655
Age (years)	-0.004	0.006	-0.731
Gender (female=1)	-0.189*	0.116	-1.629
Education (years of formal schooling)	-0.034*	0.019	-1.776
Family size (#)	-0.018	0.020	-0.928
Certification status (fully certified =1)	-0.954***	0.185	-5.157
Group size effects (group gets weaker =1)	0.277	0.387	0.715
Net benefit score	-0.007	0.013	-0.553
Trust score	-0.356**	0.170	-2.088
Asymmetric information (present=1)	0.227*	0.140	1.621
Adjusted R-squared		0.410	
N		151	

Notes *Significant at 10% level of probability, ** Significant at 5% level of probability. *** Significant at 1% level of probability.

The extent to which households differ in their contribution to the collective good has fascinated a number of economists and social scientists with much emphasis being placed on the role of gender. There was some evidence that women are less inclined to free-ride than men as the gender coefficient was negative and statistically significant. This supports Bryson's (2006) finding in New Zealand that women were less likely to free-ride than men. Andreoni *et al.* (2003) also found strong evidence that women and men have different preferences towards charitable contributions.

Free-riding levels are also negatively associated with increasing levels of education. The coefficient estimated for education is statistically significant implying that relatively more educated organic farming group members were less likely to free-ride. The majority of rural household heads have low education levels. This makes education attainment a valuable asset in organic groups. The majority of illiterate members are most likely to look

up to more educated group members for guidance and leadership. This makes it difficult for the very few educated members to shirk even if they wanted to do so. This is consistent with Chong's (2001) finding that better educated individuals are more cooperative.

Certification status is a highly significant determinant of free-riding behaviour. EFO's new (partially certified) members were more likely to free-ride than are founding (fully certified) members. This finding is entirely consistent with the horizon problem described by Cook and Iliopoulos (1999, 2002) where, in the absence of tradable benefits and voting rights, new entrants free-ride on investments made by founding members. This could be referred to as forced free-riding because new members are forced to acquire new membership without paying for additional value created by founding members. It is also consistent with Chong's (2001) finding that length of association is negatively associated with free-riding among water users in Nicaragua and Guatemala. An alternative explanation may be that levels of trust increase with the length of association. Free-riding by partially certified could be due to lack of commitment induced by an inferior certification status while full certification provides a psychological perception of completeness.

Other studies of trust and cooperation raised concerns that the trust variable might be endogenously determined, giving rise to an endogeneity problem (La Porta *et al.,* 1997; James, 2003; James & Sykuta, 2006; Mushayanyama & Darroch, 2006). A Hausman specification test for endogeneity (Gujarati, 2003: 756) was conducted and failed to reject the hypothesis of exogeneity at the 5 per cent level of probability. All variables, including trust, were therefore regarded as exogenous variables. The regression coefficient estimated for trust was statistically significant and carried a negative sign supporting Dirk's (1999)

contention that increasing trust in external agents (the buyer) reduces free-riding within the group. Free-riding is less likely to occur in situation where group members trust each other. Trust motivates group member to conform to generally accepted norms of group behaviour such as making a fair contribution, relying on others and trusting each other (Sheppard, 1995).

There was also some support for the argument that the presence of asymmetric information encourages free-riding. The regression coefficient estimated for asymmetric information was positive and statistically significant suggesting that members aware of the flawed grading procedures act opportunistically and free-ride. Research has shown that the temptation to free-ride is not reduced by identifiability of contributions per se, but the increased chances of being caught that identifiability makes possible (Harkins, 1987). Hence, awareness of loopholes in the grading procedures would not invite free-riding if the risk of being caught is perceived to be high.

Increasing group size is assumed to stimulate free-riding behaviour, but is of no consequence if effective monitoring mechanisms are in place. It was anticipated that concerns about the large increase in EFO's membership would represent a significant determinant of free-riding in the absence of proportionality between individual costs and benefits. While perceptions that the group would weaken with increasing size do appear to contribute positively to free-riding, the effect was not statistically significant, possibly reflecting the subjective nature of the variable used to measure changes in group size. The other insignificant variables included age, family size, and net benefit score.

8.6 Chapter summary

Organic groups cannot afford to ignore the consequences of free-riding on the performance of their members. Free-riding is a major concern in smallholder organic groups particularly if farmers with large land sizes are the culprits. Ideally, these are farmers who are better positioned to absorb free-riding by small farmers as long as their net benefits are positive. Free-riding makes member investments unattractive as returns are appropriated by those who have not contributed to their creation.

Principal components analysis was used to combine three variables measuring different aspects of free-riding into a single index. Members' scores on this index highlighted the presence of free-riding, and cross-tabulation of the index with farm size benchmarked the seriousness of the problem. Larger farmers, essential to EFO's collective marketing effort, exhibited relatively high levels of free-riding behaviour. Results of the OLS model suggested that members who are male, poorly educated, partially certified, aware of asymmetrical information related to grading procedures, and who do not trust the buyer were more likely to free-ride.

CHAPTER 9

THEORETICAL AND EMPIRICAL MODEL OF CONTRACTUAL ARRANGEMENTS AT EFO

NIE theory is applied to data gathered from members of EFO to assess their perceptions of existing contractual terms, and to quantify the impact of these perceptions on contract performance. Marketing contracts adopted by such groups tend to regulate transactions between the group and outside buyers such as pack houses and retailers. EFO is no exception, having negotiated a contract with just one buyer, a pack house in the city of Durban. This chapter presents the empirical models used to analyse contractual arrangements at EFO. It then focuses on variables used to explain contract performance and preferred contractual terms. This is followed by descriptive statistics and a discussion on parameters estimated for the models explaining contract performance and preferred contract clauses.

9.1 Analysing contractual arrangements at EFO

9.1.1 Rationalising the empirical model of contract performance

EFO management entered into a verbal marketing contract with the pack house. As explained earlier, the organisation pooled produce grown individually by its members and sold it to the pack house, where the produce was graded and repackaged for onward sale to the Woolworths retail chain. Some contractual terms are renegotiated seasonally, usually with the help of a facilitator from the University of KwaZulu-Natal. The level of vertical coordination or contractual control by either party was limited. For example, the pack house did not employ production contracts, preferring a ‘hands off’ approach even though

organic production is a complex process and incentives for opportunistic behaviour may exist within the supply chain (Hayenga *et al.*, 2000).

According to Sykuta and Parcel (2002) the basic source of value for most speciality crops is linked to the delivery of a particular type or identity of what could be generally be regarded as a commodity crop. EFO members were not compensated for supplying fresh vegetables to the pack house, but were paid for supplying organically produced vegetables. The basic source of value in the contract was, therefore, a farmer's effort in preserving the organic identity of the produce. EFO's management employed internal inspectors to help them monitor individual members' compliance with organic farming standards both during the conversion period and after attaining full certification status. This was the only way of preserving organic identity under group certification when crops were produced independently by individual members. Non-compliance by any member could jeopardise the efforts of the entire group.

A snapshot at some important contract clauses presented in Table 9.1 indicates that the contract between EFO and the pack house was verbal and denominated in weight. The pack house unilaterally set the base price of each year, had the power to call for deliveries to begin and had total control over grading procedures. As a result, members complained frequently about pricing, payment, grading and treatment of rejected produce in particular, and contract implementation in general.

Data relating to perceptions of existing contract clauses included each member's understanding of contract format, denomination (weight or area), delivery calls, grading procedures, and price determination. Members were also asked to state their preferred

contractual terms. Information about actual terms specified in the verbal contract was elicited from key informants within EFO's management committee. These variables complement observations on grower and farm characteristics.

Table 9.1 presents sample means computed for the dependent and explanatory variables considered in a model proposed to quantify the impact of perceived contract clauses on contract performance. Contract performance is usually assessed based on agreed targets or benchmarks. In this study, contract performance was measured by the quantity of organic produce delivered to the pack house by each farmer. This measure of performance was considered reasonable because EFO does assign delivery targets to individuals members in absolute terms. The quantity supplied by the each farmer therefore reflects an attempt at fulfilling the membership obligations of the group. Failure to meet such quotas could be indicative of extra-contractual marketing by the producers or poor crop yields. Either way, it demonstrates inability to meet contractual obligations, hence poor contract performance. It is therefore reasonable to use the quantity of produce delivered to the pack house as a relative measure of contract performance. The model postulated that contract performance was influenced by perceived contractual terms and control variables such as age, gender, organic farming experience, and farm size.

In Table 9.1, contract format refers to the choice between a verbal (informal) and a written (formal) contract. In reality, EFO's agreement with the pack house is a verbal contract, yet 15% of the organisation's members claimed that it was a written contract. It was anticipated that members who perceived that the agreement was a verbal contract would tend to under-perform, *ceteris paribus*, because informal contracts are difficult to enforce and make it easy for other members to shirk on their obligations.

Table 9.1: Descriptive statistics for variables included in the contract performance model (N=151), EFO, KwaZulu-Natal, 2004/5

Dependent variable				
Variable	**Unit**	**Description**	**Mean**	
Quantity of produce	Tons	Produce delivered by member to EFO in 2004	0.224	
Explanatory variables			**Mean**	**Actual[#]**
Age	Years	Farmer (member's) age	50.05	
Farm size	Hectares	Total farm size including land rented	0.59	
Organic farming experience	Years	Years as an organic farmer (EFO member)	2.51	
Gender	Binary	If female =1, male = 0	0.75	
Contract format (CF)	Binary	Perception that current contract is verbal =1, or written = 0	0.85	1
Contract denomination (CD)	Binary	Perception that current contract is weight denominated = 1, or 0 if area based	0.79	1
Delivery calls (DC)	Binary	Perception that buyer calls for deliveries to begin =1, otherwise =0	0.81	1
Grading procedures (GP)	Binary	Perception that contract does not specify proper grading procedures =1, otherwise =0	0.54	1
Price determination (PD)	Binary	Perception that price is jointly determined by buyer and EFO =1, otherwise =0	0.56	0

[#] 'Actual' indicates contractual terms actually specified by EFO's verbal marketing agreement.

Most studies of contract choice and design use the 'contract' as the unit of analysis. In this case, as with most efforts to integrate smallholders into favourable markets, there was a single contract between the (horizontally coordinated) farmer's group and the buyer. Owing to the absence of a standard written contract, the verbal contract provided a good simulation of multiple contracts as farmers are likely to differ in their understanding of the verbal clauses. For these reasons, members were taken as the unit of analysis. Each member declared his or her knowledge of existing contract specifications as well as their preferred specifications, making it possible to compare perceived, preferred, and actual

contract clauses – an approach similar to that employed by Fraser (2005), Goodhue *et al.* (2000) and Sykuta and Parcel (2002).

Contracts like EFO's may be denominated in terms of weight or area. In the former case, farmers are obliged to supply a specific volume of produce to the buyer over a given period of time. In the latter case, farmers must plant a specific area with the buyer obligated to purchase all of the output. Weight based contracts assign yield risk to the farmer while area based contracts shift this risk to the buyer. Members who (correctly) perceived that EFO was contracted to produce a particular volume of each organic crop were therefore expected to be more concerned about performance than those who thought that the contract was area based.

Delivery calls defining rights to call for supplies influence the distribution of risk between contractual parties. The party that decides when deliveries should start and end is better placed to manage deliveries to his or her advantage. Members of EFO were more likely to under-perform if they perceived that the pack house had the right to call for deliveries as the timing and delivery window may not coincide with physiological crop maturities experienced by growers.

Grading procedures should not only specify criteria for classifying produce into different grades, but should also define when, how and by whom grading is to be done, and the procedures for dealing with rejected produce. Unfortunately, EFO's verbal contract does not address all of these issues adequately. Although members grade their own produce, EFO pools deliveries from its growers and the buyer re-grades the pooled produce when it arrives at the pack house. Members with high rejection rates free-ride on those with lower

rejection rates because rejected produce cannot be traced back to individual growers. Respondents frequently complained that their produce was being unfairly downgraded by the buyer. It was therefore anticipated that members who perceived that grading procedures were not properly specified by the verbal contract would tend to deliver less produce to the organic market.

Price determination in spot markets is a function of demand and supply. Under contractual arrangements, prices are usually determined jointly by the buyer and seller. However, EFO appears to have little bargaining power – possibly because it lacked alternative organic markets, whereas the pack house can purchase organic products from competing suppliers. According to members of EFO's management committee, the pack house established a base price at the beginning of each season. It was anticipated that members who perceived that base prices were jointly determined would deliver more produce to the pack house.

9.1.2 Rationalising the empirical model of preferred contract clauses

Following Sykuta and Parcel's (2002) study, logit models were proposed to identify the determinants of preferred contract characteristics considered to be of central importance to the performance of EFO's collective contract with the pack house. Table 9.2 presents descriptive statistics for these key preferences. Literature has shown that contract choice is a function of farm and grower characteristics (Fraser, 2005; Goodhue *et al.*, 2000) including age (which is also a proxy for past farming experience not necessarily tied to organic farming), education (which influences ability to prepare and read a written contract), the household's stock of farm labour, and its income from farming.

Table 9.2: Descriptive statistics for variables used to explain preferred contract format and contract denomination (N=151), EFO, KwaZulu-Natal, 2004/5

Dependent variables			
Variable	**Unit**	**Description**	**Mean**
Preferred contract format	Binary	Written contract preferred =1, verbal =0	0.14
Preferred contract denomination	Binary	Area denominated contract preferred =1, weight based =0	0.71
Preferred grading procedures	Binary	Well defined grading procedures preferred =1, otherwise=0	0.99
Preferred price determination	Binary	Joint price setting preferred =1, otherwise=0	0.99
Preferred delivery calls	Binary	Farmer's call for deliveries preferred =1, otherwise =0	0.95
Explanatory variables			
Variable	**Unit**	**Description**	**Mean**
Age	Years	Farmer's age	50.05
Formal education	Years	Years of formal schooling	4.60
Family labour	Adult equivalents	Available family labour	4.12
Farm income	Rands[#]	Cash income from organic sales in 2004/5	545.34
Organic farming experience	Years	Years as an organic farmer (EFO member)	2.51

One US Dollar = 6.45 Rand at the time of the survey (South African Reserve Bank, 2005).

It is not possible to rationalise *a priori* how all of these variables were likely to affect preferences for particular contractual terms, but it was anticipated that preferences for written contracts, area based denomination, well-defined grading procedures, jointly negotiated prices and delivery calls made by farmers would strengthen with increases in member education and the importance of farm income.

9.1.3 Modelling contract performance

The model of contract performance proposed by Equation (14) was estimated using ordinary least squares (OLS) regression. Equation (14) proposed that quantities of organic

produce delivered by members to EFO for sale to the pack house depends on farm, farmer, and contract characteristics:

$$Y_i = \alpha X_{ij} + \beta Z_{ij} + \varepsilon \quad (14)$$

where; Y_i = quantity of organic produce delivered by the i^{th} EFO member to the pack house,

α = coefficients of farm and farmer characteristics,

X_{ij} = vector of farm and farmer characteristics,

β = coefficients of binary contract variables,

Z_{ij} = vector of dichotomous variables representing perceived contractual terms, and

ε = random error.

Contract performance (Y_i) was measured by the quantity of organic produce delivered by each EFO member to the pack house during the 2004/5 marketing season. Farm and farmer characteristics (X_{ij}) were represented by variables such as age, gender, organic farming experience and farm size, while the (Z_{ij}) indicated perceptions that the contract entitled the pack house to call for deliveries, specify joint price determination and grading procedures, was denominated by weight and verbal rather than written.

9.1.4 Modelling preferred contract clauses

Equation (15) postulates that each of the key contract clauses preferred by EFO members is influenced by personal and farm characteristics. Equation (15) is expressed as a binary logit model as the preferred contract clauses were all expressed as dichotomous variables. For a binary response model, $Y \in (0,1)$ let x be a vector of z regressors, and π_i be the probability $\Pr(Y=1|x)$. The logistic model is a linear model for the log odds, or logit that $Y=1$, given the values in x (Gujarati, 2003:595-596).

$$Logit_i = \ln\left(\frac{\pi_i}{1-\pi_i}\right) = \alpha + \beta X_i \qquad (15)$$

where; α = intercept,

β = vector of regression coefficients, and

X_i = vector of farm and farmer characteristics.

Logit models were postulated for preferred contract format, preferred contract denomination, preferred grading procedures, preferred method of price determination and preferred delivery calls. These models included personal attributes and farm characteristics as possible determinants of preferred contract clauses. Possible determinants of these five preferences include formal education and organic farming experience as personal characteristics, and farm income and the household's stock of farm labour as farm characteristics (Table 9.2). Formal education was likely to capture the effects of age and gender because the vast majority of EFO's members were elderly women with low levels of education.

9.2 General assessment of contract impact at EFO

Interviews conducted with key informants helped to identify information needed to assess individual costs and benefits of honouring EFO's contract with the pack house. It was clear that the verbal contract enabled coordination, making the supply chain more efficient when compared to no contracting. Transaction costs normally incurred in the marketing of fresh produce were considerably reduced for both individual farmers and the buyer. In addition, transport and fencing costs were subsidised by the government.

However, there was limited transfer of market information, management skills or organic production technology to farmers despite the buyer occasionally meeting with members to educate them about grading and quality issues. The contract provided a hedge against downward movements in producer prices, but disadvantaged producers when prices increased. When a contract specifies a fixed price, both parties expect the contract price to differ from the spot price. Problems develop when the price gap becomes too wide for too long, thereby encouraging the disadvantaged party to default (Koehler, 1999). When the pack house was at a disadvantage it stopped making calls for deliveries in order to cut its losses. The contract assigned this right to the pack house without specifying a delivery window or the terms of the buyer's call (e.g. the notice period). Impromptu calls with short notice periods were common, encouraging members to sell organic produce in conventional fresh produce markets rather than endure the risk of damage to mature crops whilst waiting for the buyer's next call.

At the time of the study, the contract provided local farmers with their only avenue to an organic market. Market access was reasonably assured and the buyer carried some price risk. Access to capital is often a prerequisite for sustainable production in smallholder

agriculture systems (Delgado, 1999). The buyer facilitated a deal with the Provincial Department of Agriculture and Environmental Affairs (DAEA) whereby members were granted fencing materials to protect their crops against damage caused by stray livestock. Otherwise, there was no improvement in their access to agricultural credit or organic inputs - including disease free planting materials. This meant farmers still used the same production system as was the case before conversion and did not benefit in any significant way from the organic contract in that regard.

The narrow range of benefits accruing to farmers indicates that EFO's marketing contract has not set a strong precedent for organic farming projects aimed at alleviating poverty in rural South Africa. Nor has the uncertainty that surrounds the contract itself.

9.2.1 Impact of contractual terms on contract performance

Members' perceptions of existing contract clauses highlight their confusion about actual contractual terms, and are used to explain differences in contract performance between individual members. Table 9.3 presents the OLS estimates of the parameters (α and β) defined in Equation (14).

The binary variables - contract format, contract denomination, grading procedures, price determination and delivery calls - are collinear, which makes it impossible to estimate their separate effects on contract performance. Two linear indexes of these variables are extracted using Principal Components Analysis (PCA). A Principal Components Analysis based only on binary dummy variables is sometimes referred to as a Principal Co-ordinate Analysis (Joliffe 1986: 200). The PCA yielded two principal components with eigen values

greater than one, represented by Equations 16 and 17. Together, these two PCs explain 64.7% of total variation in the binary variables, with PC_1 accounting for 37.4% of the total variation.

$$PC_1 = 0.863PD^* - 0.799DC^* - 0.547GP^* \quad (16)$$

$$PC_2 = 0.842CD^* - 0.731CF^* \quad (17)$$

where the asterisks denote standardised variables.

The standardised component loadings indicate the relative contribution of each variable to the principal component. PC_1 attributes relatively high loadings (greater than $|0.3|$) to price determination, delivery calls and grading procedures. This index increased when members perceived that prices were jointly determined, delivery calls were made by the EFO, and grading procedures were well defined. PC_2 attributes relatively high loadings to contract denomination and contract format. This index increased when the contract was perceived to be weight denominated and formalised in writing. Both of these indexes were therefore expected to bear positively on contract performance and were substituted for the binary contract dummies in Equation 14. The OLS estimators of Equation 14 are presented in Table 9.3.

The regression coefficient estimated for age was statistically significant and positive, suggesting that older members were more inclined to comply with the buyer's calls than were younger members. Although the coefficient estimated for organic farming experience was not statistically significant, it had a t-value greater than unity and therefore warranted

consideration. The positive sign suggests that contract performance improved as members gained experience as organic farmers, or possibly those members of longer standing had developed confidence in the contract and were more willing to sell produce to the pack house.

Table 9.3: Impact of perceived contract provisions on quantity of organic produce delivered by members of EFO, KwaZulu-Natal, 2004/5.

Predictors	**β**	**Standard error**	**t-value**
(Constant)	0.027	0.155	0.175
Age (years)	0.005**	0.002	1.912
Farm size (ha)	0.009	0.029	0.307
Gender (female =1, male =0)	0.026	0.069	0.373
Organic farming experience (years)	0.002	0.002	1.303
PC_1 – index of price determination, delivery calls & grading procedures [a]	0.138***	0.029	4.721
PC_2 – index of contract format & contract denomination [b]	-0.021	0.031	-0.664
Adjusted R^2		0.22	
N		151	

Notes [a] First principal component.
[b] Second principal component.
*significant at 10% level of probability, ** significant at 5% level of probability.
***significant at 1% level of probability

The regression coefficient estimated for PC_1 was statistically significant. Its positive sign was consistent with the arguments presented in Chapter 4. Contract performance improves when members perceived that: (a) prices were determined jointly by EFO and the pack house, (b) deliveries were called by EFO and not by the pack house and (c) grading procedures were well defined. This result supports previous findings that flawed grading procedures encouraged EFO's members to withhold their best quality produce from the organic market (Gadzikwa, *et al.,* 2006b) and that the benefits of collective marketing were being undermined by a lack of synchronisation between harvesting and delivery.

The regression coefficient estimated for PC_2 was not statistically significant suggesting that perceptions of a written, weight denominated contract did not have a positive influence on contract performance. The overriding importance of PC_1 was illustrated by its standardised regression coefficient (beta) of 0.41. Age was the next most important variable with a beta of 0.19, followed by organic farming experience with a beta of 0.12. PC_2 had an absolute beta of just 0.06.

9.2.2 Determinants of preferred contract provisions

Preliminary analysis of the contract clauses in Table 7.1 indicate that only the preferred contract format and preferred contract denomination variables contained enough variation to permit further analysis. The other preferred contract characteristics - proper grading procedures, joint price determination and farmer's delivery calls - lacked variability (see Table 7.1) leading to their exclusion in subsequent analyses.

Table 9.2 presents descriptive statistics for preferred contract clauses and for variables thought to influence their choice. Only 14% of the members preferred a written contract, but 71% preferred an area denominated contract (71%). Almost all members preferred well-defined grading procedures (99%), joint price setting (99%), and farmer delivery calls (95%). Of the other explanatory variables in Table 9.2, only the descriptive statistic for farm income from organic sales was not discussed in preceding sections. Family labour was now computed as an average for all EFO members. Family labour and farm income had mean values of 4.12 (adult equivalents) and R545.34 per annum respectively.

9.2.3 Preferred contract format and contract denomination

As explained in Section 9.2.2, the vast majority (71%) of EFO's members stated a preference for area rather than weight denomination. This was expected as area denomination shifts the burden of yield risk to the buyer. Conversely, a small minority (14%) of EFO's members stated a preference for a written rather than a verbal contract. Like the OLS results presented in Section 9.2.1, this finding is at odds with the view that verbal agreements discourage performance by introducing uncertainty and inviting free-riding. Low levels of literacy might explain this anomaly. The results of the logit analyses are presented in Table 9.4.

Table 9.4: Logit models of preferences for written and area denominated contracts, EFO, KwaZulu-Natal, 2004/5

	Preferred contract characteristic							
	Written contract				Area denominated contract			
Predictors	**β**	**Standard error**	**Wald χ^2**	**Odds ratio**	**β**	**Standard error**	**Wald χ^2**	**Odds ratio**
Constant	1.077	0.912	1.396	0.341	0.792	0.490	2.614	2.207
Formal education	0.099*	0.060	2.685	1.104	0.154***	0.052	8.785	1.166
Family labour	-0.106	0.138	0.582	0.900	-0.136	0.092	2.163	0.873
Farm income	0.001**	0.000	3.826	1.001	0.000	0.000	0.205	1.000
Organic farming experience	-0.551**	0.262	4.409	0.577	-0.008	0.023	0.114	0.992
-2 Log likelihood	91.96**				146.62***			
N	151				151			

* Significant at 10% level of probability, ** significant at 5% level of probability, *** significant at 1% level of probability.

With regard to contract format, the coefficient estimated for education was positive and statistically significant. The preference for a written contract strengthens with increasing

levels of formal education, suggesting that farmers with relatively more schooling were better able to read and understand written contracts.

In this study, poor education was also a proxy for age and gender because the vast majority of EFO's members were elderly women with low levels of education. This was consistent with Saenz-Segura's (2006) finding in Costa Rica that older, more experienced farmers with less education preferred verbal contracts. Goodhue *et al.* (2000) and Fraser (2005) found a positive relationship between educational qualifications and the preference for written contracts in the United States of America and Australian wine industries respectively.

The coefficient estimated for farm income was statistically significant and bears positively on preferences for a written contract. A plausible explanation is that members who derive more income from farming have more to lose if the pack house does not honour its contract with EFO and therefore favour the relative security of a formal contract over an informal one. Increasing levels of organic farming experience tend to reduce preferences for a written contract. Again, this was consistent with Saenz-Segura's (2006) finding and lends support to the view that members of longer standing have developed confidence in their verbal contract.

Two variables appeared to influence preferences for area based contract denomination; formal education and family labour. The significant and positive coefficient estimated for formal education suggests that better educated members may be more aware of the relationship between yield risk and contract denomination. These members favoured a contract based on area rather than weight as it obliges the buyer to purchase all outputs if

there is a bumper crop and to source crops elsewhere if there is a shortfall. The coefficient estimated for family farm labour was not statistically significant but has a Wald χ^2 statistic greater than two. Its negative sign suggested that members with less household labour to draw on also prefer a contract based on area – possibly because labour shortages exposed them to additional source of yield risk.

9.3 Chapter summary

Contracts enable smallholders to access organic markets and could have considerable impact on quality and loyalty issues along the supply chain. Because production systems are better managed, the quality of produce vastly improves and loyalty is reinforced by a contract in situations where farmers are afforded the opportunity to deliver frequently, cutting down post-harvest losses and amounts of rejected produce. As expected, EFO farmers are confused about the organisation's verbal contract with its buyer (a local pack house). There is no consensus on the contractual clauses. An evaluation of how differences over perceived contract clauses impacts on contract performance measured in absolute terms by the amount of organic produce supplied to the pack house by each farmer produced mixed results. Improved contract performance is associated with the perception that; (a) prices are determined jointly by EFO and the pack house, (b) deliveries are called by EFO and not by the pack house, and (c) grading procedures are well defined and prevent free-riding by growers who deliver products of inferior quality.

Choice of preferred contract clauses reveals an underlying attempt to mitigate production and marketing risks associated with smallholder organic farming. Improved education and income levels and low organic farming experience are positively aligned with written contracts. Area dominated contract is favoured by members with higher levels of formal

education (awareness) and lower levels of family farm labour. Labour shortages heighten the risk that farmers bear when the contract was weight denominated. In summary, contract performance is enhanced by contract clauses that mitigate production and market related risks perceived by organic farmers.

CHAPTER 10

CONCLUSIONS AND RECOMMENDATIONS

The main objective of this study was to contribute to the body of knowledge on functions and operations of organic certified smallholder groups by exploring institutional and contractual arrangements that would make such groups more effective in accessing high value niche markets.

This study drew on the NIE's collective action and transaction cost theories to identify possible determinants of participation in EFO, a certified organic farming group operating in the former Umbumbulu magisterial district of KwaZulu-Natal, as an institution to improve smallholder access to a niche market by reducing unit production, marketing and transaction costs in the supply chain. A multinomial logit model was estimated to isolate significant determinants of three different levels of participation in EFO (non-members, partially certified members and fully certified members). Explanatory variables included farm and farmer attributes, a variable measuring the perceived net benefits of collective action, and indicators of production and transaction costs.

The results indicated that continued participation in EFO was not influenced by the age or gender of the farmer, was positively influenced by growth in the net benefits of participation, and negatively by an increase in the size of the smallholder's cropland or non-farm earnings. With respect to production and transaction costs, the results suggest that EFO has reduced fully certified members' concerns that crops would be damaged by livestock or constrained by inadequate technical information. However, this is not the case

for other problems such as price uncertainty in conventional markets, lack of affordable operating inputs, lack of affordable transport, and a lack of communications infrastructure.

The major obstacle to unlocking member investments could be the existence of free-riding problems within the group. The study revealed an internal free-rider problem at EFO and identified its determinants. Principal components analysis was used to combine three variables measuring different aspects of free-riding into a single index. Members' scores on this index highlighted the presence of free-riding, and cross-tabulation of the index with farm size benchmarked the seriousness of the problem. Larger farmers, essential to EFO's collective marketing effort, exhibited relatively high levels of free-riding behaviour. Results of the OLS model suggested that members who are male, poorly educated, partially certified, aware of asymmetrical information related to grading procedures, and who do not trust the buyer were more likely to free-ride.

Considering the importance of an incentive compliant contract to mitigate free-rider problems, it was disappointing to find that EFO's members were confused about the organisation's verbal contract with its buyer (a local pack house). Descriptive statistics measuring farmers' perceptions of the contract terms revealed a lack of consensus about contractual clauses. The study then evaluated how the confusion over contractual terms impacted on contract performance, where contract performance was measured as the quantity of organic produce delivered by EFO members for sale to the pack house. Principal component indexes of perceived contractual terms were regressed on contract performance using an OLS model that controlled for farm and farmer characteristics. The OLS results showed that contract performance improved when members perceived that; (a) prices are determined jointly by EFO and the pack house, (b) deliveries are called by EFO

and not by the pack house, and (c) grading procedures are well defined and prevent free-riding by growers who deliver products of inferior quality.

Logit models were then estimated to identify the determinants of some preferred contract clauses. The results indicated that members with higher levels of formal education (literacy) and farm income, and lower levels of experience, favoured a written contract over a verbal contract. Similarly, members with higher levels of formal education (awareness) and lower levels of family farm labour favoured a contract denominated by area rather than by weight. Labour shortages heighten the risk that farmers bear when the contract was weight denominated.

It can be concluded that EFO should target households that rely on farming for income and that are relatively land constrained. EFO is more likely to survive if it continues to secure fully subsidised information, transport, fencing and certification services for its members, and if it improves the benefits of participating by synchronising harvest and delivery dates, negotiating price discounts for organic inputs, and by maintaining an office with telephone, fax and postal services. However, long-term sustainability is unlikely if the organisation has to rely on subsidies to meet recurrent expenditure on private goods like transport and certification services. Subsidy dependence could be reduced by recruiting more members and marketing larger volumes. This will facilitate bulk discounts and reduce EFO's average fixed costs, including those arising from investments in equipment and plant of its own. The need for investment raises questions about EFO's ability to raise capital. A fundamental question is whether or not members, lenders, and potential partners (e.g. the pack house owner) have an incentive to finance EFO.

In the longer-term, EFO should eliminate institutionalised free-riding by re-organising along the lines of an investor-owned firm that issues tradable ownership rights proportional to individual investment. This will facilitate partnerships needed to finance value-adding investments that improve the flow of net benefits to members. In the short-term, EFO must engage with the pack house to remove flaws in the grading process that conceal the origin of low quality produce. Transparent and mediated negotiations leading to an incentive compliant contract with the buyer may also help to build trust and so reduce free-riding within EFO. Information about the goals and benefits of membership should be actively disseminated. Penalties for non-compliance might also be considered.

The study also recommends that the terms of EFO's contract be revised so that: (a) delivery calls can be made by either the pack house or by EFO during pre-specified periods and with reasonable notice, and (b) grading procedures are fully transparent and ensure traceability so that losses caused by poor quality can be internalised to members who deliver inferior produce. In addition, it is important that prices should be negotiated at the beginning of each season and that the parties should have recourse to pre-agreed facilitators and an arbitrator to resolve disputes on price and quality. A written contract is recommended to support these more complex terms, with the proviso that the contract is explained to current and prospective members, and that growers are fully informed of their rights and obligations.

While the above recommendations address specific issues at group level there are more issues that are critical demanding attention at organic industry level. South Africa has no national organic standards and regulations in place and as a result, government's support to the organic sector is rendered in an *ad hoc* by different government departments in pursuit

of their national mandates. This creates confusion in the organic industry and reduces the impact organic agriculture might have on the South African economy. Clearly, government needs to clarify policies relating to organic production and marketing. The study proposes the following specific policy recommendations to address collective action, free-riding and contractual problems in smallholder farming groups.

There is need for a policy that promotes smallholders' continued participation in collective marketing groups and discourages member exit. Such a policy should encourage participation by consolidating existing collective action benefits through formulation and implementation of measures that minimise or even eliminate transaction costs experienced by participating farmers. Improving communication infrastructure and transport networks in the rural areas would help alleviate problems of access to market and communication. In addition, productivity could improve if farmers have access to affordable production inputs. Ensuring that rural farmers have access to affordable financial products will address the problem of affordability and present farmers with more choice regarding input suppliers.

While policies that reduce transaction costs will enhance farmer participation, appropriate institutional arrangements that curb free-riding behaviour by aligning costs and benefits of participating smallholders are equally important. There is need to encourage smallholder farmers to select appropriate legal entities with well-defined property rights. While co-operatives are suitable under certain circumstances, the promotion of better organisational forms such as 'New Generation' co-operatives should be a priority. The policy required to stimulate smallholder participation in collective action and curb free-riding must take into account the role played by contracts. Properly designed contracts will safeguard vulnerable

farmers from many uncertainties and risks associated with collective marketing. The primary policy objective will be to encourage written contracts that mitigate yield and price risks and curb internal free-riding through promotion of better contract performance.

SUMMARY

The NIE framework offers a number of approaches, techniques and concepts for analysing institutions or 'rules of the game' that shape the incentives which guide decisions taken by individuals. The first general approach is that of transaction and information costs in which institutions are viewed as transaction-cost minimising arrangements. The second approach is concerned with collective action and elimination of the free-rider problem in the provision of collective goods.

These approaches are pertinent to the study of certified organic farming groups such as EFO. On the one hand, smallholders face high fixed production and transactions costs relative to income when accessing markets individually owing to their small surpluses. It follows that small farmers incur high unit transport, information, and monitoring costs (Hobbs, 1997). On the other hand, collective action to dilute these fixed production and transaction costs introduces other costs and is often hampered by problems such as free-riding (Hardin, 1982; Ostrom, 1992a) when farmer groups organise along the lines of conventional cooperatives (Cook & Iliopoulos, 1999). Despite powerful conceptual insights shed by collective action and transaction cost theories, application of both theories remains limited (Benham & Benham, 2000). This study draws on both theories to analyse the role played by EFO in addressing production and marketing constraints perceived by members and non-members. In addition, the study draws on free-riding theory to measure the prevalence of internal free-riding at EFO and to identify its determinants.

From a NIE perspective, contracts are viewed as governance mechanisms designed to minimise transaction costs. NIE views contract farming as one form of governance in the

vertical coordination continuum, lying somewhere between the spot market and full vertical integration. Williamson (1991) identified three classes of contracts that have relevance in determining coordination performance. These are classical, neoclassical and relational contracts. NIE provides a theoretical framework that helps to explain the existence of contract farming, as many problems associated with imperfect and missing markets are caused by asymmetric information and other factors that raise transaction costs (Minot, 1999; Grosh, 1994; Key & Rusten, 1999). NIE theory is applied to data gathered from members of EFO to assess their perceptions of existing contractual terms, and to quantify the impact of these perceptions on their delivery of organic vegetables. Marketing contracts adopted by such groups tend to regulate transactions between the group and outside buyers such as pack houses and retailers. EFO is no exception, having negotiated a contract with just one buyer, a pack house. The study also seeks to identify determinants of preferred contractual terms. It does not test for optimality of current contract design, nor does it explicitly test for propositions of contract theory.

EFO was initiated in 2001 by the University of Natal, (which subsequently merged with University of Durban Westville to form University of KwaZulu-Natal) as a project to produce traditional vegetables. The group explored and achieved organic certification in 2003. At the time of the study, EFO the oldest certified organic farming group in South Africa, pooled and sold produce grown individually by its members to a pack house near the city of Durban. The pack house supplied a retail chain well known for its high quality products in South Africa. Principal crops cultivated include *amadumbe*, green beans, sweet potatoes, and potatoes. EFO's constitution entrenches several principles that underpin traditional cooperatives; such as net margins distributed according to patronage, democratic control (one member one vote) and open membership. Membership comprises

of fully organic certified farmers who founded the organisation, and partially certified members who joined later and who are transitioning to fully certified status. Unlike a cooperative, EFO has no equity ownership scheme and, therefore, does not offer shares in return for capital invested by its members. The arguments presented by Cook and Iliopoulos (2002) seem to suggest that EFO is likely to suffer from free-rider problems because the gains from cooperative action can be accessed by individuals who did not fully invest in creating them.

This study was conducted within Embo community in the Umbumbulu Magisterial District, KwaZulu-Natal. Data were collected from a census survey of 151 EFO members and sample survey of 49 non-EFO members. Of the 151 EFO members, 48 were fully certified and 103 were partially certified organic farmers. Data were gathered in two phases. In the first phase, a producer and a household questionnaire were administered in the last quarter of 2004 to all respondents. In the second phase, a follow-up producer and household questionnaires were administered during the first quarter of 2005. These questionnaires surveys were complemented by key interviews held with some members of EFO management committee.

The investigation of factors influencing continued participation in EFO's marketing effort by individual members revealed that participation was encouraged by growth in net benefits of participating, and negatively correlated with increasing farm size or non-farm income. The evaluation of production and transaction costs showed that EFO managed to reduce fully certified members' concerns that crops would be damaged by livestock or constrained by inadequate technical information. However, members were still concerned about price uncertainty in conventional markets, lack of affordable operating inputs, lack

of affordable transport and a lack of communication infrastructure. This implies that collective action was not effective in reducing these transaction costs.

This study revealed that an internal free-riding problem existed within EFO. Using three variables measuring different aspects of free-riding, a free-riding index was computed, which was then cross tabulated with farm size. Unfortunately high index scores, indicative of serious free-riding, were observed among larger farmers essential to EFO's collective marketing effort. This poses serious questions about future sustainability of the group as a whole. Without being definitive about free-riding levels in EFO, the results suggest that the group is prone to the "sucker" effect caused by free-riding behaviour. As result, non free-riders may reduce their efforts in response to internal free-riding. The estimated empirical free-riding model indicated that members who were male, poorly educated, partially certified, aware of asymmetrical information related to grading procedures, and who did not trust the buyer were more likely to free-ride.

The findings on the existing verbal contract between EFO and pack house showed that EFO was benefiting from better coordination compared to no contracting. Some transaction costs were reduced for both individual farmers and the buyer such as transport, which was subsided by government. The major weaknesses of the contract included limited transfer of market information, management skills and organic technology to the farmers by the buyer. Despite being hedged against downward movement in produce prices, the farmers were disadvantaged when the prices increased. In some instances, the pack house stopped making delivery calls when prices were high to cut on its losses.

Given the verbal nature of the contract and the limited range of benefits accruing to the farmers, the study examined the members' understanding of verbal contract clauses and their impact on contract performance. Contract performance being measured by the quantity of produce delivered to the pack house, the results showed that older farmers were more cooperative and were more like to heed buyers' calls than younger ones. An index of contract clauses suggested that joint price determination by EFO and pack house, well defined grading procedures and farmer made delivery calls had a positive impact on deliveries made to the pack house, hence contract performance.

A further evaluation of determinants of preferred contract clauses evaluated the determinants of preferred contract format (verbal or written) and contract denomination (area or weight) clauses. Preference for any of these clauses could be indicative of clauses likely to dominate in future organic contracts. Poor education, a proxy for age and gender as the majority of EFO members were old women with low literacy levels, was associated with preference for verbal contracts. Farmers who had more organic farming experience also preferred verbal contracts, possibly due to increased confidence in verbal contracts over time. By contrast, farmers relying more on farm income preferred written contracts that are relatively more secure. The preference for area based contract was influenced by formal education and family labour. The more educated members were aware that an area based contract shifts the risk to the buyer who is forced to purchase all output in case of a bumper harvest and source it elsewhere when there is shortfall.

This study has contributed to the understanding of smallholder organic farming group institutions. Further research is still required to test the study's findings over several groups and over time. The implications of other institutional problems such as influence, horizon,

and portfolio on sustainability of collective outcomes should be investigated, in addition to seeking a better understanding of their determinants. This study concludes that collective action should be strengthened through ensuring group access to subsidized services, synchronisation of harvesting and delivery dates, and through investment in business assets.

Free-riding can be mitigated through issuance of tradable shares and engaging with the buyer to remove flaws in the grading procedures that conceal origins of poor quality produce. The group's marketing effort should be supported by an incentive compliant contract that ensures transparent in grading and implementation of delivery calls and jointly negotiated prices. These contract terms must be supported by a written contract to minimise misinformation about contract terms and improve contract enforcement.

At policy level, the study recommends that the promulgation of a policy that consolidates the benefits accruing to farmers engaged in collective action by minimising the levels of production and transaction costs faced by smallholders. Such a policy should be tailored to promote the development of appropriate organisational arrangements that are better at aligning costs and benefits of participating in collective action in an attempt to curb institutional problems such as free-riding. Equally important is the need to promote use of written contracts that protect smallholders in contractual arrangements from yield and price risks. Properly designed contracts will also positively impact on a group's overall contract performance.

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APPENDIX A

EFO BASELINE QUESTIONNAIRE 2004: CROP PRODUCTION SURVEY: EFO MEMBERS

Interviewer: _____

Date: _____

Respondent is fully certified	
Respondent is not fully certified	

UNIVERSITY OF KWAZULU-NATAL

The information captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal to inform EFO farmers, prospective members and stakeholders how they might improve their organic farming venture. Respondents do not have to answer questions – answers are voluntary. The respondent must be a member of the EFO.

Respondent's full name		**Household number:**		**GPS coordinate:**	
Respondent's age					
Respondent's gender					

For further information call: Dr Sheryl Hendriks, Food Security Programme, University of KwaZulu-Natal. Tel: 033 2605726

1 **Crops produced organically** in the **2003/4** season (September 2003 – end of August 2004) (Note: some information about crops grown organically has already been gathered, and will be inserted before the interview)

Crops grown	Total area planted (Specify unit e.g. 1/10 ha)	Portion of total area planted that is rented in or borrowed (Specify unit e.g. 1/10 ha)	Sales to packhouse			Sales to non-organic markets[1]	
			Sold to packhouse (**Y** or **N**)	Average unit price (R/unit)	Total revenue from sales (Rands)	Average unit price (R/unit)	Total revenue from sales (Rands)
Amadumbe							
Potatoes							
Sweet potatoes							
Green beans							
Fallow land							
Totals (for office use)							

Note: [1] Sales to hawkers, local neighbours, Isipingo direct, etc.

2 **Crops produced inorganically** (i.e. with chemical fertilisers) in the **2003/4** season (September 2003 – end of August 2004)

Crops grown	Planted **Y** or **N**	Total area planted (Specify unit e.g. 1/10 ha)	Portion of total area planted that is rented in or borrowed (Specify unit e.g. 1/10 ha)	Average unit price (R/unit)	Total revenue from sales (Rands)
Amadumbe					
Potatoes					
Sweet potatoes					
Dry beans					
Maize					
Sugarcane					
Bananas					
Chillies					
Other: Please specify Peanuts					
Fallow land					
Totals (for office use)					

3 If land was borrowed or hired to produce crops in the 2003/4 season (September 2003 – end of August 2004), capture the following information about the main land transaction (tick where relevant):

What type of transaction was negotiated?	☐ Cash rental ☐ Crop payment ☐ No payment/Favour ☐ Return of a Favour
	☐ Verbal agreement ☐ Written contract
	☐ Short-term (one year or less) ☐ Long-term (more than one year)
Who lent or rented out the land to you?	☐ Family relative ☐ Friend ☐ Stranger

Was this main land transaction to borrow or hire land **specifically for organic crop production**? ☐ Yes ☐ No

If yes, then for **which organic crop(s)**?_____

Inputs used for organic crops produced in the 2003/4 season (September 2003 – end of August 2004)

Input	Quantity used (kg)	Average unit price (R/kg)	Total cost (Rands)	Allocation of input between organic crops				
				Amadumbes	Potatoes	Sweet potatoes	Green beans	Dry beans
Purchased manure								
Own manure								
Own compost								
Purchased amadumbe seed								
Own amadumbe seed								
Purchased potato seed								
Own potato seed								
Purchased sweet potato seed								
Own sweet potato seed								
Purchased green bean seed								
Own green bean seed								
Hired labour								
Family labour								
Hired tractor and equipment								
Own tractor and equipment								
Hired draught oxen								

Own oxen								

4 **Potato keeping quality** in the **2003/4** season (September 2003 – end of August 2004) (tick where appropriate)

	Aug 03	Sept 03	Oct 03	Nov 03	Dec 03	Jan 04	Feb 04	Mrch 04	Aprl 04	May 04	Jun 04	Jul 04
When do you plant potatoes?	☐	☐	☐	☐	☐	☐	☐	☐	☐			
When do you harvest potatoes?			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

6 **Potato harvesting, storage and grading** in the **2003/4** season (September 2003 – end of August 2004) (tick where appropriate)

What is the main factor that determines when you start harvesting potatoes?						
Do you practice sequential harvesting?	☐ **Y** ☐ **N**	Why? Why not?				
Do you store potatoes for home consumption?	☐ **Y** ☐ **N**	How are potatoes stored?				
What is the main form of quality loss if potatoes are stored?		Sprouting	Rotting	Greening	Insect damage	shrinking:
Do you grade your own potatoes at harvest?	☐ **Y** ☐ **N**	What qualities are used to grade potatoes?				
Have you increased your area of potatoes over time?	☐ **Y** ☐ **N**	Why? Why not?				
How many times did you sell potatoes to the packhouse last season?						
How many weeks do your potatoes remain saleable after harvesting?						
Is this a problem?	☐ **Y** ☐ **N**					
What qualities do you think consumers are looking for in organic potatoes?						
Do you think your potatoes meet the grade expectations of the packhouse?	☐ **Y** ☐ **N**	Why? Why not?				
What quantity of potatoes grown last summer did you deliver to the packhouse?	(Kilograms)					
What quantity of your <u>own</u> delivery was rejected by	(Kilograms					

the packhouse?	or don't know)	
Could improved storage facilities or technologies lead to increased income from potatoes?	☐ **Y** ☐ **N**	

7 Answer the following questions about **amadumbe** in the **2003/4** season (September 2003 – end of August 2004 (tick where appropriate):

What quantity of amadumbe grown last summer did you deliver to the packhouse?	(Kilograms)	
What quantity of your <u>own</u> delivery was rejected by the packhouse?	(Kilograms or don't know)	
Could storage facilities make you better off?	☐ **Y** ☐ **N**	

8 Rank the following **constraints on organic cropping** from **1 to 3** where **1 is no problem** and **3 is a severe problem** (tick where appropriate):

Constraint	1 No problem	2	3	Constraint	1 No problem	2	3
Livestock damage crops				Inputs not available at affordable prices			
Uncertain climate (*e.g.* drought)				Tractor is not available when I need it			
Uncertain prices for products sold to packhouse				Cannot find manure to purchase			
Uncertain prices for products sold to other markets				Cannot find labour to hire			
More work than the family can handle				Cannot access more cropland			
Lack of cash and credit to finance inputs				Delays in payment for products sent to packhouse			
Lack of information about producing organic crops				Lack of bargaining power over product prices at the packhouse			
Lack of information about alternative markets				Lack of information about consumer preferences for our organic products			
Lack of proper storage facilities				Packhouse does not reward me fully for my own product			
Lack of affordable transport for products							
Lack of telephones to negotiate sales							

9 **Participation in EFO** (tick where appropriate):

When did you first become a member of the EFO?	**Year**	**Month**
Do you participate in the EFO Executive Committee?		☐ **Y** ☐ **N**
If yes, what is your role in the Executive Committee?		☐ 1 ☐ 2 ☐ 3 ☐ 4
Do you participate in the EFO Internal Applications Committee?		☐ **Y** ☐ **N**
If yes, what is your role in the EFO Certifications Applications Committee?		☐ 1 ☐ 2 ☐ 3 ☐ 4
Are you an EFO internal inspector?		☐ **Y** ☐ **N**

10 What **benefits** did you **expect** when you joined the **EFO**?

11 What **benefits** do you **actually** get from **being a member of EFO**? Rank the perceived benefits from **1 to 4** where **1 is no benefit** and **4 is a major benefit** (tick where appropriate):

Benefit	Ranking of benefits actually received			
	1 none	2 some	3 satisfactory	4 major
Better access to tractor services				
Better access to organic crop production advice				
Provision of fencing for fields				
Access to a reliable market				
Better prices for crops				
Better access to inputs If yes, please specify what inputs (e.g. more land)				
A community organisation to lobby for assistance				
Payment of organic certification fees				

12 What **costs** did you **expect** when you joined **EFO**?

13 What **costs** does EFO **actually** impose on you? Rank perceived costs from **1 to 4** where **1 is no cost** and **4 is an excessive cost** (tick where appropriate):

Cost	Ranking of actual costs			
	1 none	2 some	3 reasonable	4 excessive
Membership fees				
Time attending meetings				
More work effort in crop production				
Increased expenditure on hired labour and other farm inputs				

14 Some members of EFO may benefit more than others just because they produce more. Do you think that members who get more benefit should also contribute more to the cost of running the EFO?	☐ Y ☐ N ☐ DK

15 **EFO rules and procedures** (tick where appropriate)

How often do ordinary members meet each year?	**Times**
How many general meetings have you attended since January this year?	**Meetings**
Do non-members also attend these general meetings? If so, are they allowed to vote when electing representatives to the Executive Committee at the Annual General Meeting (AGM)?	☐ **Y** ☐ **N** ☐ **DK** ☐ **Y** ☐ **N** ☐ **DK**
Have you read EFO's constitution or had it explained to you?	☐ **Y** ☐ **N**
Would you say that the procedures followed when electing representatives to the Executive Committee are correct? If not, why not?	☐ **Y** ☐ **N** ☐ **DK**
Are you able to vote and express yourself freely at general meetings?	☐ **Y** ☐ **N** ☐ **DK**
Does the Executive Committee present a record of its financial transactions to members at the AGM?	☐ **Y** ☐ **N** ☐ **DK**
Does someone who is trusted by the members check the financial records?	☐ **Y** ☐ **N** ☐ **DK**
Does the Executive Committee meet regularly every month?	☐ **Y** ☐ **N** ☐ **DK**
Do members of the Executive Committee ever get paid for the services that they provide to the EFO?	☐ **Y** ☐ **N** ☐ **DK**

Can members attend Executive Committee meetings even if they are not members of the Committee? If so, are those people who are not members of the Executive Committee allowed to vote on management decisions (*e.g.* to build a new storage facility)?	☐ **Y** ☐ **N** ☐ **DK** ☐ **Y** ☐ **N** ☐ **DK** -
If the Executive Committee asked members for contributions to finance a new storage facility, would each member be expected to make the same contribution? If no, would the costs be shared in proportion to the size of members' farms or deliveries?	☐ **Y** ☐ **N** ☐ **DK** ☐ **Y** ☐ **N** ☐ **DK**
Do you think that there are improvements or assets that EFO could be financing but is not	☐ **Y** ☐ **N**
Did you have enough information about the EFO when you joined?	☐ **Y** ☐ **N**
Does the EFO give you enough information about its operations?	☐ **Y** ☐ **N**

16 Sources of agricultural information

16.1 What is the name of the Department of Agriculture Extension Officer?

16.2 Which of the following sources of agricultural information have you used in the past **about organic farming** (tick where appropriate)?

Information source	Used?
EFO farmers	☐ Y ☐ N
University (Dr Modi, students or FSG)	☐ Y ☐ N
Assagay Organics (James's packhouse)	☐ Y ☐ N
Radio	☐ Y ☐ N
Print media (books, pamphlets, newspapers, etc.)	☐ Y ☐ N

Information source	Used?
Department of Agriculture	☐ Y ☐ N
Paeta (Nelly)	☐ Y ☐ N
Rainman LandCare Foundation (Raymond)	☐ Y ☐ N
AFRISCO (certifying body)	☐ Y ☐ N
Private firms that supply inputs	☐ Y ☐ N

16.3 Please estimate the total number of hours per week that you spend getting information about organic farming from all the sources **combined** that you use: ____Hours

17 To what extent do you **agree or disagree** with the following statements about your **working relationship with the agent** at the packhouse (tick the appropriate block or write DK if the respondent cannot answer) :

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
Trust:				
We have a strong personal confidence in each other				
We have a strong business confidence in each other				
We can always rely on each other when it counts				
This agent will work hard in the future to maintain a close relationship with EFO				
I am very confident that this relationship will continue in the future				
This agent is trustworthy				
This agent has always been fair in his negotiations with us				
Communication:				
We often discuss issues such as changes in customers needs for organic products				
We have extensive formal communications				
We have extensive informal communications				
We discuss only need-to-know information that relates directly to our relationship				
We make joint decisions about:				
Reducing costs in the packhouse				
Organic product delivery scheduling				
Organic product quality control				
Improving organic product quality				

New organic products to grow				
Commitment:				
We work together to achieve productivity gains from which we both benefit				
We devote considerable time to trying to improve this relationship				
We devote considerable time trying to improve packhouse productivity				
We have made major changes in our delivery schedule in order to deal more effectively with the packhouse				

18 How **satisfied** are you with your **working relationship with the agent** at the packhouse over the last season (tick where appropriate)?

Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied

19 How would you describe the **level of cooperation** between **you and the agent** at the packhouse in the following activities (tick where appropriate)?

Activity	Very High	High	Moderate	Low	Very Low
Organic crop production planning					
Organic crop harvest scheduling					
Organic crop marketing					
Organic crop quality control					
Planning to produce new organic crops					

20 Literacy (tick where appropriate):

	Yes	Some	No
Can you read and write IsiZulu?			
Can you read and write English?			

21 If the respondent can read and write at least some English, ask him/her to read the following words and to write their IsiZulu or English equivalents if they are willing to try:

IsiZulu	**English**
Ukhula	
	Poison
	Manure
Izincingo	
	Date of planting
	Explain how you fertilise your field

Thank you for participating in this survey.

APPENDIX B

EFO BASELINE QUESTIONNAIRE 2004 : CROP PRODUCTION SURVEY: NON MEMBERS

Interviewer: _____

Date: _____

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KWAZULU-NATAL

The information captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal to inform EFO farmers, prospective members and stakeholders how they might improve their organic farming venture. Respondents do not have to answer questions – answers are voluntary. The respondent should be the household head.

Respondent's full name		**Household number:**		**GPS coordinate:**	
Respondent's age					
Respondent's gender					

For further information call: Dr Sheryl Hendriks, Food Security Programme, University of KwaZulu-Natal. Tel: 033 2605726

1 **Crops produced** in the **2003/4** season (September 2003 – end of August 2004)

Crops grown	Planted **Y** or **N**	Total area planted (Specify unit e.g. 1/10 ha)	Portion of total area planted that is rented in or borrowed (Specify unit e.g. 1/10 ha)	Average unit price (R/unit)	Total revenue from sales (Rands)
Amadumbe					
Potatoes					
Sweet potatoes					
Dry beans					
Maize					
Sugarcane					
Bananas					
Chillies					
Other: Please specify					
Fallow land					
Totals (for office use)					

2 If land was borrowed or hired to produce crops in the 2003/4 season (September 2003 – end of August 2004), capture the following information about the main land transaction (tick where relevant):

What type of transaction was negotiated?	☐ Cash rental ☐ Crop payment ☐ No payment/Favour ☐ Return of a Favour
	☐ Verbal agreement ☐ Written contract
	☐ Short-term (one year or less) ☐ Long-term (more than one year)
Who lent or rented out the land to you?	☐ Family relative ☐ Friend ☐ Stranger

Which crop(s) was this main land transaction to borrow or hire land used for? _____

3 **Inputs used** for crops produced in the **2003/4** season (September 2003 – end of August 2004)

Input	Quantity used (kg)	Average unit price (R/kg	Total cost (Rands)	% Allocation of input between crops					
				Maize	Potatoes	Beans	Sugarcane	Sweet potatoes	Amadumbe
Purchased manure									
Own manure									
Own compost									
Purchased fertiliser									
Purchased chemicals									
Purchased maize seed									
Own maize seed									
Purchased potato seed									
Own potato seed									
Purchased bean seed									
Other purchased seed:									
Other own seed :									
Hired labour									
Family labour									
Hired tractor and equipment									
Own tractor and equipment									
Hired draught oxen									

4 Rank the following constraints from **1 to 3** where **1 is no problem** and **3 is a severe problem** (tick where appropriate):

Constraint	1	2	3	Constraint	1	2	3
Livestock damage crops				Tractor is not available when I need it			
Uncertain climate (*e.g.* drought)				Cannot find manure to purchase			
Uncertain prices for products				Cannot find labour to hire			
More work than the family can handle				Cannot access more cropland			
Lack of cash and credit to finance inputs				Cannot join EFO			
Lack of information about producing crops				Other: Please specify			
Lack of proper storage facilities							
Lack of affordable transport for products							
Lack of telephones to negotiate sales							
Inputs not available at affordable prices							

5 **Non-participation in EFO** (tick where appropriate):

Have you heard about the EFO?	☐ *Y* ☐ *N*	
Have you considered joining the EFO?	☐ *Y* ☐ *N*	
If not, why not?	☐ ***I do not know what the EFO does***	
	☐ ***I do not want to grow organic crops***	
	☐ ***I cannot complete the form that EFO members must submit for certification***	
	☐ ***I do not know how to grow organic crops***	
	☐ EFO does not treat its members fairly	
Explain why if you feel that EFO does not treat its members fairly		

6 Sources of agricultural information

6.1 What is the name of the Department of Agriculture Extension Officer?_____

6.2 Which of the following sources of agricultural information have you used in the past year (tick where appropriate)?

Information source	Used?
Other farmers	☐ Y ☐ N
Department of Agriculture	☐ Y ☐ N
Private firms that supply inputs	☐ Y ☐ N
Radio	☐ Y ☐ N
Print media (books, pamphlets, newspapers, etc.)	☐ Y ☐ N

Information source	Used?
Others: Specify	☐ Y ☐ N
	☐ Y ☐ N
	☐ Y ☐ N
	☐ Y ☐ N
	☐ Y ☐ N

6.3 Please estimate the **total** number of hours per week that you spend getting information about farming **from all the sources combined** that you use: _____ Hours.

7 **Literacy**: (tick where appropriate):

	Yes	Some	No
Can you read and write IsiZulu?			
Can you read and write English?			

8 If the respondent can read and write at least some English, ask him/her to read the following words and to write their IsiZulu or English equivalents if they are willing to try:

IsiZulu	**English**
Ukhula	
	Poison
	Manure
Izincingo	
	Date of planting
	Explain how you fertilise your field

Thank you for participating in this survey.

APPENDIX C

EMBO/EFO HOUSEHOLD AND CONSUMPTION QUESTIONNAIRE 2004

The information captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal to inform EFO farmers and stakeholders how they might improve their organic farming venture. Respondents do not have to answer questions – answers are voluntary. The respondent should be the *de facto* (actual) household head.

Interviewer: _____

Date: ____ _____

UNIVERSITY OF
KWAZULU-NATAL

Respondent's name:		Household number:		GPS coordinate:	

For information call: Dr Sheryl Hendriks, Food Security Programme, University if KwaZulu-Natal. Tel: 033 2605726

	Write the names of all household members									
	1…… HEAD	**2….. **	**3…..**	**4…..**	**5…..**	**6…..**	**7…..**	**8…..**	**9…..**	**10…..**
1. Is …… Male or female	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F
2. If the household head is a female is she widowed?	☐ Y ☐ N									
3. Age in years	____	____	____	____	____	____	____	____	____	____
4. Highest level of completed schooling or educational	____	____	____	____	____	____	____	____	____	____
5. Occupation (no in household of each) 1 = WAGE EMPLOYED 2 = FARMER HHFARMER 3 = SELF-EMPLOYED 4 = HOUSEKEEPER 5 = PENSIONER 6 = DISABLED 7 = UNEMPLOYED BUT SEEKING WORK 8 = SCHOLAR 9 = Infant or child (0 – 6 years) 10 = Vagrant	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐10
6. Wage or salary income (Rands per month)	____	____	____	____	____	____	____	____	____	____

7. Income remitted by migrants and commuters (Rands per month)	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
8. If the household head is a migrant or weekly commuter, who is the *de facto* household head?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

9. During the past year did any household member earn income through any of the non-farm enterprises listed below? If yes, report the income from each activity.	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N	☐ Y ☐ N
9.1 Hiring out accommodation	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.2 Hiring out contractor services or equipment	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.3 Milling grain	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.4 Baking, brewing or selling meals	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.5 Building or repairing houses	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.6 Block making, stone- or metalwork	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.7 Hawking	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.8 Shop-keeping	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.9 Repairs and maintenance of cars	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
9.10 Making furniture or handicrafts	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

10. Do you have a savings account (i.e. bank, post office, stockvel etc)? If yes, please provide the following information:	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**	☐ **Y** ☐ **N**
10.2 Current level of savings (Rands) = less than R500 2 = R501 – R1000 3 = R1001 – R5000 4 = more than R5001 DK = do not know	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ DK

11. Housing attributes

Number of rooms to sleep in	
Does the household have electrical power?	☐ no electricity ☐ solar power ☐ generator ☐ Eskom power
Main source of drinking water:	☐ stream/river ☐ unprotected spring ☐ protected spring ☐ borehole ☐ rain tank ☐ stand pipe

12 On-farm improvements

Improvement	Financed privately (Y or N)	Year	Financed by an outsider (Y or N)	Year
Irrigation				
Lime				
Fencing for crops				
Crop storage silo				
Water tanks				
Chicken house				

Livestock fencing for manure collection				
Other: Please specify				

13. Which of the assets listed below does the household own (only items in working order)?

☐ Y ☐ N	Land line telephone in the dwelling
☐ Y ☐ N	Cell phone
☐ Y ☐ N	Radio
☐ Y ☐ N	Hi-fi / music centre
☐ Y ☐ N	Television
☐ Y ☐ N	Personal computer
☐ Y ☐ N	DVD / VCR (video player)
☐ Y ☐ N	Maize mill
☐ Y ☐ N	Fridge/freezer
☐ Y ☐ N	Bicycle
☐ Y ☐ N	Motorbike
☐ Y ☐ N	Trailer/cart
☐ Y ☐ N	Sewing machine
☐ Y ☐ N	Motor vehicle in running order
☐ Y ☐ N	Generator
☐ Y ☐ N	Plough
☐ Y ☐ N	Planter, harrow or cultivator
☐ Y ☐ N	Wheelbarrow
☐ Y ☐ N	Tractor

14. Land tenure security

14.1 What rights can the household exercise on its own cropland? (tick where appropriate):

Right / Response	Build structures	Plant trees	Erect fences to exclude others:		Bequeath/leave to children	Lease out	Sell
			Summer	All year			
No							
Yes, **with consent** from local authority							
Yes**, without approval** from local authority							

14.2. Crop damage caused by livestock (tick where appropriate)

14.2.1		Did livestock stray into your cropland after you planted it last season? If no, go to question 14.2.6		☐ **Y** ☐ **N**
	14.2.2	If yes, were your crops damaged by the livestock?	☐ **Y** ☐ **N**	
	14.2.3	If yes, did you seek redress or help from the traditional authority?	☐ **Y** ☐ **N**	
	14.2.4	If yes, were you awarded compensation for the damage?	☐ **Y** ☐ **N**	
	14.2.5	If your crops were damaged and you did not seek legal redress (help), did the owner of the livestock pay you any compensation for the damage?	☐ **Y** ☐ **N**	
14.2.6		Are there rules limiting the number of livestock that people may graze on communal land?		☐ **Y** ☐ **N**
	14.2.7	If yes, are penalties applied to people who exceed the limit?	☐ **Y** ☐ **N**	

15 Livestock

Livestock and livestock products	Cattle	Goats	Sheep	Pigs	Chickens /ducks	Donkey/ horses	Other: specify
Number currently owned by all household members							
Approximate value of livestock (Rands)							
Number sold during past year							
Total income from animal sales during past year (Rands)							
Animals slaughtered for food in past year							
Animals slaughtered for festivities in past year							
Total income form product sales? Eg eggs, skin, manure, milk (Rands in past year)							

16 C**redit and cash loans**

Question	Transaction
Amount of cash borrowed or credit used (Rands)	
Main purpose of loan or credit	
Source of loan or credit	
If security was required by the lender, what security was provided	

17. Income shocks

How does the household cope with major income shocks (e.g. drought, death of a bread winner, job loss, etc.) (Please tick where appropriate)

Sell livestock	☐ **Y** ☐ **N**
Sell other assets	☐ **Y** ☐ **N**
Use own cash savings	☐ **Y** ☐ **N**
Borrow money from relatives	☐ **Y** ☐ **N**
Borrow money from stokvel	☐ **Y** ☐ **N**
Receive help from friends or relatives	☐ **Y** ☐ **N**
Take on additional work	☐ **Y** ☐ **N**
Reduce spending	☐ **Y** ☐ **N**
Reduce food consumption	☐ **Y** ☐ **N**
Reduce or stop debt repayments	☐ **Y** ☐ **N**
Other: Please specify	☐ **Y** ☐ **N**

18. In this section, we look at the patterns of food **consumption for all resident household members**. This should include all the food they have eaten. It should not include food that has been bought for resale or exchanging for commercial purposes. Below is a list of different kinds of food that people may have eaten in the past **MONTH**.

Food Item	**Was [..] eaten by this household in the past *month*? Yes No**	**If yes, what was the value of [..] eaten from *purchases* in the past month? Rand**	**What was the value of [..] eaten received as *gifts* in the past month? Rand**	**What was the value of [..] eaten received as *payment* in the past month (including rations)? Rand**	**What was the value of [..] eaten from *own production* in the past month? Rand**
Maize grain /					
Mealie Meal / Maize Flour					
Rice					
White / Brown Bread					
Wheat Flour					
Breakfast Cereal – cornflakes, oats					
Dried Peas / Lentils / Beans					
Potatoes					
Tomatoes					
Sweet Potatoes					
Madumbes					
Vegetable Oil					
Peanuts/ Other nuts					
Peanut butter					
Margarine/Butter / Other Fats					
Cheese					

Jam					
Fresh Milk/ Steri Milk / UHT					
Sour Milk/ Maas/ Yoghurt					

Food Spending and Consumption (Continued)

Food Item	**Was [..] eaten by this household in the past *month*? Yes No**	**If yes, what was the value of [..] eaten from *purchases* in the past month? Rand**	**What was the value of [..] eaten received as *gifts* in the past month? Rand**	**What was the value of [..] eaten received as *payment* in the past month? Rand**	**What was the value of [..] eaten from *own production* in the past month? Rand**
Baby Formula **baby**					
Milk Powder/coffee creamers					
Sugar					
Mutton / Beef / Pork / Goat meat					
Tinned meat / Processed meat / Polony					
Offal					
Chicken					
Eggs					
Fresh Fish					
Tinned Fish					
Pumpkin / squash					
Green mealies					
Green vegetables / Tinned vegetables					
Carrots and beetroot / Tinned vegetables					
Other vegetables / Wild vegetables / Imifino					
Bananas					
Apples, peaches, guavas etc.					
Citrus fruit (orange, lemon, nartjies)					
Soft drinks (Coke etc)					
Tinned fruit					
Meals prepared outside home (take aways)					
Other food expenditure / consumption					

	Were any [..] ? **Yes No**	**If yes, what was the total value in the past month? (Rand)**
Meals Given to Guests	☐ **Y** ☐ **N**	
Meals Received as Guests	☐ **Y** ☐ **N**	

19 Regular Non-Food Spending

FOR EACH ITEM, ASK: In the past **MONTH**, about how much did the residents of the household spend on [..] ?

PERSONAL ITEMS:		**Rands per month**
Cigarettes, tobacco	☐ **Y** ☐ **N**	
Beer, wine, spirits	☐ **Y** ☐ **N**	
Entertainment (cinema, sports, music, lottery, etc)	☐ **Y** ☐ **N**	
Personalised care items: cosmetics, soap, shampoo, haircuts, and so on	☐ **Y** ☐ **N**	
Newspapers/stationery, envelopes, stamps	☐ **Y** ☐ **N**	
Telephone (rental + calls + prepaid) including cell phone	☐ **Y** ☐ **N**	
REGULAR TRANSPORT COSTS:		
Petrol, oil and car/bakkie service	☐ **Y** ☐ **N**	
Buses, taxis, and trains	☐ **Y** ☐ **N**	
MISCELLANEOUS:		
Washing powder etc.	☐ **Y** ☐ **N**	
Crèche/Childcare	☐ **Y** ☐ **N**	
Religious and membership dues of organisations	☐ **Y** ☐ **N**	
Informal taxation and donations	☐ **Y** ☐ **N**	
Domestics, gardeners and other household labour	☐ **Y** ☐ **N**	
ENERGY, WATER AND MUNICIPAL RATES:		
Water	☐ **Y** ☐ **N**	
Electricity	☐ **Y** ☐ **N**	
Other energy sources (wood, paraffin, charcoal/coal, candles, gas, purchasing/charging batteries, diesel oil for generators, other)	☐ **Y** ☐ **N**	

20 Occasional Non-Food Spending

FOR EACH ITEM, ASK: In the past **YEAR**, about how much did the household spend on [..] ?

HOUSEHOLD ITEMS:		**Rands per year**
Kitchen equipment, like pots and pans, lamps, torches etc.	☐ **Y** ☐ **N**	
Home maintenance and repairs to the dwelling	☐ **Y** ☐ **N**	
Bedding, sheets, blankets and towels	☐ **Y** ☐ **N**	
Furniture and other household appliances	☐ **Y** ☐ **N**	
CLOTHING AND SHOES:		
Shoes and clothes for children (excluding school uniforms)	☐ **Y** ☐ **N**	
Shoes and clothes for adults	☐ **Y** ☐ **N**	
Material to make clothing, curtains, and other items	☐ **Y** ☐ **N**	
HEALTH AND CARE:		
Medical Aid Scheme/Medical Insurance Fees	☐ **Y** ☐ **N**	
Dentists, doctors or nurses (not covered by Medical Aid/Insurance)	☐ **Y** ☐ **N**	
Hospital/Clinic fees (not covered by Medical Aid/Insurance)	☐ **Y** ☐ **N**	
Medical supplies, for example, medicines, bandages and so on (not covered by Medical Aid/Insurance)	☐ **Y** ☐ **N**	
Traditional healer's fees	☐ **Y** ☐ **N**	
PERSONAL AND OTHER ITEMS:		
Jewellery, watches, other luxury goods	☐ **Y** ☐ **N**	
Ceremonies (weddings, funerals, etc.)	☐ **Y** ☐ **N**	
EDUCATION:		
School fees and tuition	☐ **Y** ☐ **N**	
University/College fees	☐ **Y** ☐ **N**	
Books and Uniforms (including stationery)	☐ **Y** ☐ **N**	
Other School Expenses (transport, meals at school, boarding fees, contributions to school buildings, extra costs for teachers, extramural activities, other)	☐ **Y** ☐ **N**	
LIFE AND PROPERTY INSURANCE:		

Life insurance, funeral policies, burial societies	☐ **Y** ☐ **N**	
Short-term insurance (e.g., car, property & fire, crop)	☐ **Y** ☐ **N**	

21 Which months of the year did your household: (*Tick the appropriate boxes)*

	Aug 03	Sept 03	Oct 03	Nov 03	Dec 03	Jan 04	Feb 04	March 04	April 04	May 04	June 04	July 04
Buy all maize consumed by the household?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Supplemented home produced maize with bought maize meal?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Borrowed food / received food from others?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Had to eat wild food through hunting / gathering?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Begged for food?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Have to work for food in kind?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Received food as a gift?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Experience hunger?	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Thank you for participating in this survey.

APPENDIX D

EFO PRODUCER QUESTIONNAIRE 2005

The information captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal to inform EFO farmers and stakeholders how they might improve their organic farming venture. Respondents do not have to answer questions – answers are voluntary. The respondent should be a member of the EFO.

Interviewer: _____ _____

Date: _____ _____

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	GPS coordinate:	

RISK QUESTIONS

1. What is your household's approximate annual gross income (i.e., farming income plus wages, pensions, etc.)?

Annual gross income	**Tick**	**Annual gross income**	**Tick**
less than R5000		R25001 – R30000	
R5001 – R10000		R30001 – R35000	
R10001 – R15000		R35001 – R40000	
R15001 – R20000		R40001 – R45000	
R20001 – R25000		Greater than R45000	

2. Compared to other household decision makers in the region, are you more likely, less likely or equally likely to take risks?
☐ Same ☐ Less ☐ Greater.

3. If a new farming technology (e.g., a new variety of seeds) were available, compared to other farmers in this area, would you be an:
☐ early adopter ☐ would you take a wait and see attitude

4. The table below lists six choices, each describing a gamble with an equal chance of realizing the lower or higher payoff. Indicate which of the six choices you most prefer: A, B, C, D, E, or F.

Choice	Payoff 1 (Rands)	Payoff 2 (Rands)
☐ A	100	100
☐ B	90	180
☐ C	80	240
☐ D	60	300
☐ E	20	380
☐ F	0	400

5. If you are faced with an option to take a gamble or the option to receive a sure amount of money, which do you prefer?

← ☐ Option 1: A coin is tossed: TAIL: You win R380 HEAD: You win 20

☐ Option 2 →

R220	**R200**	R180	R160	R140	R120	R100	R80

If you are faced with an option to take a gamble and the option to receive a sure amount of money, which do you prefer?

← ☐ Option 1: A coin is tossed: TAIL: You win R240 HEAD: You win 80

☐ Option 2 →

R170	**R160**	R150	R140	R130	R120	R110	R100

7. The table below shows the range in net income per plot per year (total revenue minus own variable input costs, e.g., seeds, manure, and labour) for three crop combinations (A, B & C). Each outcome is equally likely.

	A	B	C
Good year	R135	R145	R175
Average year	R110	R110	R120
Poor year	R85	R75	R65

Do you prefer A or B? ☐
Do you prefer A or C? ☐
Do you prefer B or C? ☐
Have you understood this question clearly? Yes ☐ No ☐

8. The table below shows the range in net income per plot per year for another three crop combinations (D, E & F).

D	E	F
Over three years you will receive: R145 once R100 once R55 once	Over three years you will receive: R125 twice R50 once	Over three years you will receive: R150 once R75 twice

Do you prefer D or E? ☐
Do you prefer D or F? ☐
Do you prefer E or F? ☐
Have you understood this question clearly? Yes ☐ No ☐

Information questions

7.1 When you attend EFO meetings, how much information do you get on the following?
(Note: information in brackets is for clarification for the enumerator. Not to be read out)

	Tick		
	None	**Little**	**Lots**
Farming organically			
- improving the soil			
- pest and disease control			
- irrigation and water harvesting			
- not using chemical fertilizers or pest sprays			
other (specify)			
Marketing and sales			
- how much you should produce for the packhouse			
- the packhouse (its location, operations, function)			
- other places to sell organic crops			
- new organic crops (e.g. beans, herbs, etc)			
- other (specify)			
Certification			
- rules for certification			
- cost of certification			
- inspections for certification			
- results of inspections			
- other (specify)			
Organisation			
- decisions made by the Executive Committee			
- issues currently being considered by the Executive Committee			
- plans for EFOs future			
- membership (rules for joining, participation, number of members)			
- internal procedures for sale of produce (harvesting, collecting and delivering)			
- internal procedures for payment to farmers			
- other (specify)			

7.2 When you did not attend EFO's monthly meeting, how often did you get information about what was said at the meeting from the following people?

	Tick		
	Never	Sometimes	Often
Committee member			
Ordinary member			

<table>
<tr><td colspan="2">8.1 Look at the picture provided illustrating 4 sizes of traditional potatoes. Which of the 4 sizes do you usually plant?</td><td>☐ A
☐ B
☐ C
☐ D</td></tr>
<tr><td colspan="3">8.2 Why do you choose to plant this size potato seed?
_____</td></tr>
<tr><td>8.3 What criteria other than size do you use to select potato seed?</td><td colspan="2"></td></tr>
<tr><td rowspan="5">8.4 Rank the importance of EACH of the following criteria for potato seed selection:</td><td>Criteria for seed selection</td><td>Score:</td></tr>
<tr><td>Seed size</td><td></td></tr>
<tr><td>Colour</td><td></td></tr>
<tr><td>Physical damage</td><td></td></tr>
<tr><td>Rotting</td><td></td></tr>
</table>

9.1 How did you learn to farm organically?
☐ Attended courses or meetings ☐ Received on-farm instruction ☐ Gathered information myself

9.2 Are there markets other than the packhouse that pay a premium for organic crops? ☐ Yes ☐ No ☐ Don't Know

9.3 Is it easier for you to deliver produce to EFO than to other markets? ☐ Yes ☐ No ☐ Don't Know

9.4 What is your assessment of growers' time and effort invested in the organic project? ☐ Low ☐ Medium ☐ High

9.5 How many times during the past season did internal inspectors visit your farm? _____ times.

9.6 What do you think will happen to EFO as the group size increase? ☐ get stronger ☐ No change ☐ get weaker

9.7 What are the major challenges facing EFO as an organisation

10 Contractual terms between EFO and the Packhouse

	Current Position	**Preferred Position**
Is EFO's contract with the packhouse a written or verbal contract?	☐ Written ☐ Verbal ☐ DK	☐ Written ☐ Verbal ☐ DK
Does the contract require farmers to plant a minimum area (ha) or to deliver a target weight (kgs)?	☐ Area ☐ Weight ☐ DK	☐ Area ☐ Weight ☐ DK
Delivery Conditions		
Does the packhouse tell EFO farmers when to supply produce?	☐ Yes ☐ No ☐ DK	☐ Yes ☐ No
Do EFO farmers get enough notice about delivery times?	☐ Yes ☐ No ☐ DK	
What happens when supply exceeds the amount of produce required by the packhouse?	☐ Packhouse takes all ☐ DK ☐ Farmers sell surplus to other buyers	☐ Packhouse should take all ☐ EFO should sell surplus to other buyers
Is a minimum price specified before selling commences to packhouse?	☐ Yes ☐ No ☐ DK	☐ Minimum price should be negotiated ☐ No need to set a minimum price
Who determines the price of produce sold to the packhouse?	☐ Packhouse ☐ EFO ☐ Both ☐ DK	
Are bonuses paid to farmers who supply produce of superior quality?	☐ Yes ☐ No ☐ DK	
Who weighs and grades the produce?	☐ Packhouse ☐ EFO ☐ Both ☐ DK	☐ Packhouse ☐ EFO ☐ Both
Does the contract specify how grading should be done?	☐ Yes ☐ No ☐ DK	☐ Method of grading should be specified ☐ No need to specify method of grading
Does the contract specify what must be done with produce that is rejected by the packhouse?	☐ Yes ☐ No ☐ DK	☐ Treatment of rejects should be specified ☐ No need to specify treatment of rejects

Thank you for participating in this survey.

APPENDX E

EMBO/EFO HOUSEHOLD AND CONSUMPTION QUESTIONNAIRE 2005

The information captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of KwaZulu-Natal to inform EFO farmers and stakeholders how they might improve their organic farming venture. Respondents do not have to answer questions – answers are voluntary. The respondent should be the *de facto* (actual) household head.

Interviewer: _____

Date: _____

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Label to be stuck here with Household number, etc.	GPS coordinate:	

1. COPING STRATEGIES

In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	Put **X** in the column to indicate the respondent's answer				
	All the time? Every day	Often? 3 – 6 times a week	Sometimes? 1 – 2 times a week	Hardly at all? Less than once a week	Never?
a. Rely on less preferred and less expensive foods?					
b. Borrow food, or rely on help from a friend or relative?					
c. Purchase food on credit?					
d. Gather wild food, hunt or harvest immature crops?					
e. Consume seed stock held for the next season?					
f. Send household members to eat elsewhere?					
g. Send household members to beg?					
h. Limit portion sizes at mealtimes?					
i. Restrict consumption by adults in order for small children to eat?					
j. Reduce the number of meals eaten in a day?					
k. Go entire days without eating?					

2. In this section, we look at the patterns of food **consumption for all resident household members**. This should include all the food they have eaten. It should not include food that has been bought for resale or for commercial purposes. Below is a list of different kinds of food that people may have eaten in the past **MONTH**.

Food Item	**Was [..] eaten by this household in the past *month*? Yes No**	**If yes, what was the value of [..] eaten from *purchases* in the past month? Rand**	**What was the value of [..] eaten received as *gifts* in the past month? Rand**	**What was the value of [..] eaten received as *payment* in the past month (including rations)? Rand**	**What was the value of [..] eaten from *own production* in the past month? Rand**
Maize grain /					
Mealie Meal / Maize Flour					
Rice					
White / Brown Bread					
Wheat Flour					
Breakfast Cereal – cornflakes, oats					
Dried Peas / Lentils / Beans					
Potatoes					
Tomatoes					
Sweet Potatoes					
Madumbes					
Vegetable Oil					
Peanuts/ Other nuts					
Peanut butter					
Margarine/Butter / Other Fats					

Cheese					
Jam					
Fresh Milk/ Steri Milk / UHT					
Sour Milk/ Maas/ Yoghurt					

Food Spending and Consumption (Continued)

Food Item	Was [..] eaten by this household in the past *month*? Yes No	If yes, what was the value of [..] eaten from *purchases* in the past month? Rand	What was the value of [..] eaten received as *gifts* in the past month? Rand	What was the value of [..] eaten received as *payment* in the past month? Rand	What was the value of [..] eaten from *own production* in the past month? Rand
Baby Formula					
Milk Powder/coffee creamers					
Sugar					
Mutton / Beef / Pork / Goat meat					
Tinned meat / Processed meat / Polony					
Offal					
Chicken					
Eggs					
Fresh Fish					
Tinned Fish					
Pumpkin / squash					
Green mealies					
Green vegetables / Tinned vegetables					
Carrots and beetroot / Tinned vegetables					
Other vegetables / Wild vegetables / Imifino					
Bananas					
Apples, peaches, guavas etc.					
Citrus fruit (orange, lemon, nartjies)					
Soft drinks (Coke etc)					
Tinned fruit					

Meals prepared outside home (take aways)					
Other food expenditure / consumption					

	Were any [..] ? **Yes No**	**If yes, what was the total value in the past month? (Rand)**
Meals Given to Guests	☐ **Y** ☐ **N**	
Meals Received as Guests	☐ **Y** ☐ **N**	

Thank you for participating in this survey.